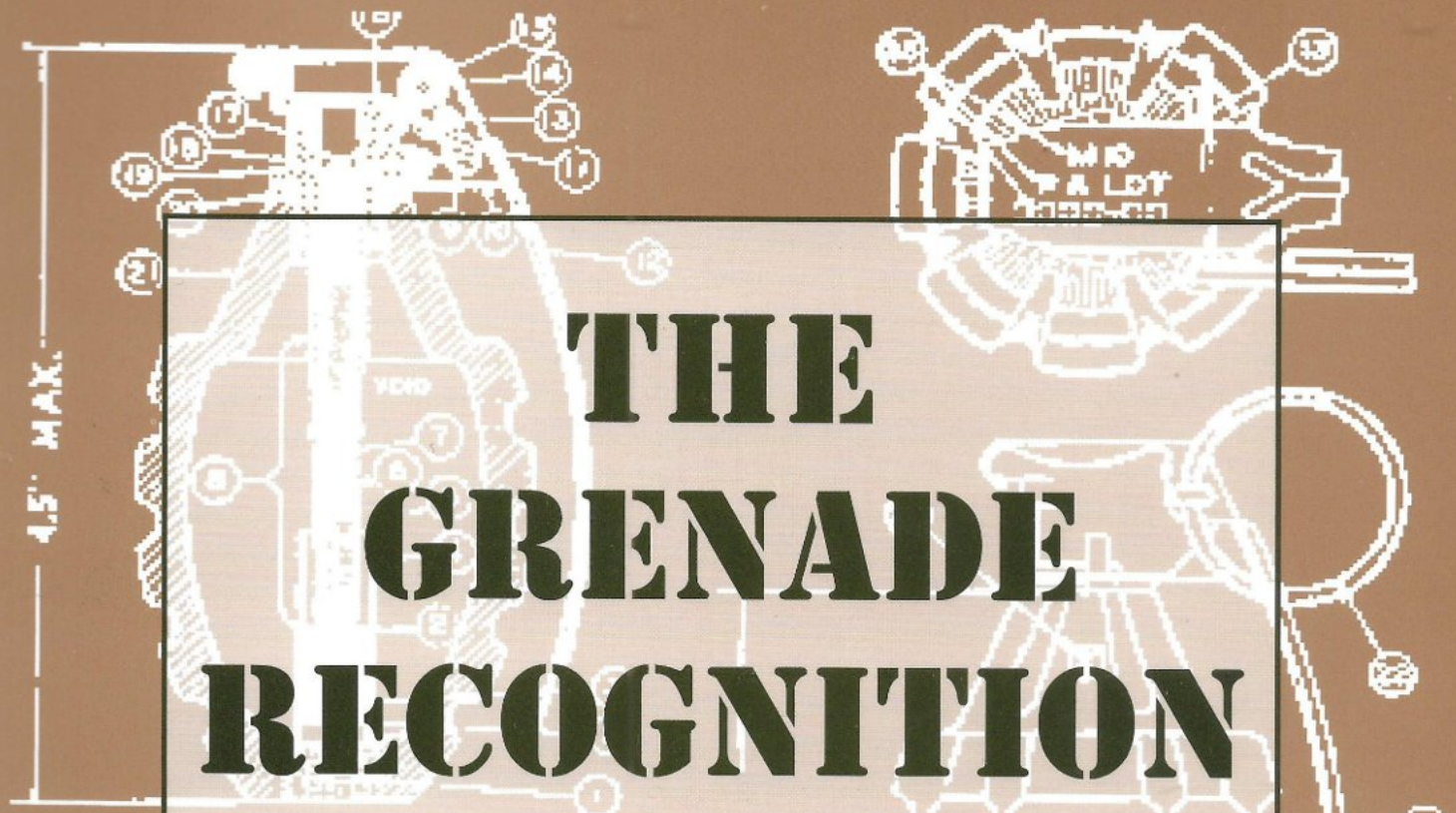

THE GRENADE RECOGNITION MANUAL

Volume 1

US Grenades and Accessories

Darryl W. Lynn

1. Filling hole plug (cork).
2. Disc (chipboard).
3. Practice charge (black powder).
4. Tube (paper).
5. Igniting charge (black powder).
6. Case (copper).
7. Time fuze (combustible).
8. N. R. C. compound.
9. Striker.
10. Fuze sealer.
11. Striker point.
12. Lever.
13. Cotter pin.
14. Hinge pin.
15. Spring.
16. Disc (tin foil).
17. Primer assembly, Mk. V.
18. Fuze body.
19. Priming Cap.
20. Washer (composition).
21. Grenade body.
22. Ring.
23. Model of fuze, manufacturer's initials, and fuze lot number stamped on lever.
24. Inspector's stamp.
25. Grenade body manufacturer's initials.

THE GRENADE RECOGNITION MANUAL

Volume 1
US Grenades and Accessories

Darryl W. Lynn

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Note: The above does not necessarily list the grenades in chronological order of design or of production.

Introduction

This manual is designed to assist EOD personnel, Police, Military personnel, historians, and collectors in the identification of grenades, grenade launchers, and the accessories that accompany them. The manual provides a listing of American grenades ranging from the Civil War to the present day. It has not been possible to compile a complete listing but it is as complete as was possible at the time of writing. The book is arranged in numerical sequence and as such is not in strict chronological order of introduction for the grenades. Where notes on packing are given, they normally relate to the original packing for that particular grenades. Over time, if the grenade has remained in service, the packing may, and probably has, changed.

Grenades are an often-ignored tool of the soldier. They are an extremely important weapon in an infantryman's arsenal but are normally passed over fairly quickly and in little detail in most weapons books. This manual is an attempt to address that shortfall and give a quick reference to those interested. I intend to continue my efforts and produce further volumes to identify many of the other grenades of the world. I have attempted to write in an easy to read style instead of a very technical manner which, I hope, will make the book more enjoyable.

I wish to thank the following people for their assistance in the production of this book. They are very knowledgeable collectors and researchers who have provided me with information and photos that would not have been available otherwise. Without their help and encouragement you would not be reading this manual:
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Finally, I thank all those that have purchased a copy, you are the final judge of its worth.

Darryl Lynn
Victoria, B.C.
November, 1998

Nomenclature

There are two basic classifications for grenades, hand and rifle. Within the two classifications there are several types. Under the classification of hand grenades the types are:

Fragmentation or Defensive — These grenades contain an explosive charge contained within a body which is designed to fragment when the explosive charge detonates. These grenades produce personnel casualties using fragments of the grenade body propelled at high speed by the explosion of the grenade.

Offensive: — These grenades contain an explosive charge in a paper or possibly plastic body which produce little or no fragmentation. Designed to produce casualties by blast effects, these are also used as small demolition charges. The casualty radius is much smaller than that of a fragmentation grenade.

Chemical: — These grenades contain a chemical agent designed to produce a toxic or irritant gas, smoke, incendiary effect, illumination, or any combination of these effects.

Practice: — These grenades contain a small spotting charge to simulate the detonation of a grenade, normally fragmentation.

Training: — These grenades contain no explosive or chemical fillings and are designed for throwing practice. They are made in the basic shape of a grenade out of cast iron or they may be totally inert versions made exactly like the live version designed for classroom training. May also include cutaway grenades.

The classification of rifle grenades contain basically the same types as the hand grenade but with some changes.

Antitank: — These grenades are designed for projection from a rifle and have a warhead designed to penetrate armour. Normally the warhead contains a shaped charge.

Anti Personnel: — These are designed to produce personnel casualties at ranges greater than that which can be obtained by a hand grenade.

Chemical: — These grenades include signals, smoke, illumination, and white phosphorous grenades. White phosphorous grenades serve a dual purpose of smoke and anti personnel.

Practice: — These grenades are modelled after live grenades and are used for firing practice of the various types.

Training: — Training grenades are made exactly like the live versions but are completely inert. This type may also include cutaway versions. These are used for classroom training.

Numbering

The American system of numbering started with the grenade's basic nomenclature, such as "Defensive Grenade", with the addition of the "Mark", abbreviated "Mk.", and a roman numeral designation after that. Grenades could be designated with different marks, such as Mk. II or Mk. III. This could be confusing due to the fact that there could be many Mk. II grenades in service at the same time, Defensive, Offensive, Gas, Incendiary, or Practice. This type of designation was introduced in the First World War and continues to the present day if the grenade is a derivative of a grenade first introduced in the First World War such as the Mk. III.

In the 1930's the system of numbering new grenades was changed to eliminate the Mk. designation, changing it simply to "M" and adding Arabic numerals. In addition, as the grenade is modified in some way, an additional designation is added as in "A1". This simply means that the M6A1 grenade is the first major modification of the M6 grenade. This numbering system continues to the present day but does not effect grenades still in service originally designated with Mk. such as the Mk. II. When the numbering system was changed in the 1930's the grenades still in service with a Mk. designation were included in the new style of modification designation. A good example of this is the "Grenade, Hand, Offensive, Mk. 3A2" which is still in service. The A2 designation means it is the second significant modification to the Mk. III grenade. At some point after the Second World War the Roman numerals used with the Mk. designations were changed over to Arabic numerals.

There exist other numbering systems in use or which have been used in the past. The "T" series being one of the best known. The "T" series are grenades which have been developed and are in the testing or trial period prior to introduction. These grenades have been developed and tested in laboratory tests and are ready for field trials. They are given a "T" designation and any modifications to them will have an additional designation of "E", for example "T13E1". This numbering system has no relation to the designation the grenade will finally have if fully adopted, for example the "T8E1" grenade became the "M22" grenade in service. This practice has since been discontinued and a new numbering system for trial grenades instituted. The new system simply puts an "X" in front of the designation the grenade will finally have. A example of this is the "XM69" which became the "M69" grenade. In addition, manufacturers may give a grenade their own designation such as "E16R2", which eventually became the M34 white phosphorous grenade.

Grenade Fuses

American grenade fuses (igniter mechanisms) come in two basic types, detonating and igniting. The detonating type is used to function grenades with a high explosive filler such as TNT, Tetryl or Composition B, or to scatter the filling as in white phosphorous grenades. The igniting type is used for grenades filled with low explosives such as EC Blankfire Powder, black powder, or for chemical and smoke fillings.

Most American grenade fuses are made up of several distinct parts:

The body

Also known as the bouchon the body is the main housing and contains the other parts. It has standard threads on the bottom to screw into the grenade body. The earlier fuses have a threading of 9/16-12, newer fuses use 5/8-12 threading. For fuses after the M200 series, a protruding "T" lug is cast onto the front portion for the safety lever to engage.

The safety lever

This device hooks around the front of the body or under the "T" lug, covers the body, and extends down the side of the grenade providing something which is easily held down keeping the grenade safe until thrown. The lever holds down the striker until the safety pin is pulled and the safety lever released.

The safety pin

Usually includes an attached pull ring to assist in its removal. The pin fits through holes on the safety lever and matching holes in the body. When in position it blocks the striker and holds the safety lever on. This pin provides a positive safety for grenades when in its proper position.

The safety clip

May be of several styles, the older style is designed for attachment to grenades manufactured prior to adoption of safety clips. One end is designed to fit around the fuze adapter or threading on the fuze and the other to clip over the safety lever, preventing it from lifting. This type remains attached to the grenade after disengagement from the safety lever. The newer style is designed for grenades manufactured after adoption. In this case the body of the fuze has been modified with the addition of a small tail on the bottom. The safety clip fits in a groove on the tail and around the safety lever. This type of clip is completely removed from the grenade when disengaged.

The striker and striker spring

These act similarly to the firing pin in a rifle. They are contained in the rear portion of the body, retained in place by an axis pin. When the safety lever is held down, the striker is held back against the pressure of its spring. When the safety lever is released, the spring forces the striker to rotate, pushing the safety lever out of the way and away from the grenade. The striker continues to rotate until it hits the primer.

The primer

The primer acts the same as a rifle primer, it contains a chemical sensitive to shock. When the striker hits the primer, it flashes producing a small flame which ignites the delay element.

The delay element

Either a short piece of Bickford fuze or a powder train contained in a small tube. The Bickford fuze was later replaced by a lead spitter fuze. This fuze consists of a preformed lead tube with a black powder core. A non-gaseous fuze powder was developed to correct some difficulties with the delay elements. In detonating type fuses a relay charge follows the delay element to transmit the flame to the upper charge of the detonator. The delay element provides the delay between the grenade being thrown and the explosion or ignition giving the grenade time to reach the target. Some of the older fuses have the disadvantage of popping, smoking, and sparking as they function, newer fuses (M200 series and after) are equipped with a delay element which is silent, smokeless, and sparkless. This prevents the enemy from easily spotting the grenade or thrower when the grenade is thrown.

The detonator or igniter.

A detonator, essentially a small blasting cap, is fitted to the end of the delay element for use with grenades filled with high explosive or white phosphorous. An igniter is fitted when used for grenades with a chemical or black powder filler. The igniter burns rapidly at a high temperature.

This is the basic time delay type of fuze, there are others such as impact fuses or those specifically designed for use in rifle grenades which do not conform to the basic elements listed above.

Fuzes

Mk. II Fuze

This fuze was developed during the First World War and was used in all the American grenades of the period, defensive, offensive, gas, and white phosphorous. The fuze is equipped with a detonator and provides a delay of about 5 seconds.

M1 Igniting Fuze

This fuze is used in the Smoke Candle, HC, Mk. II

M5 Detonating Fuze

Similar to the Mk. II in shape. This fuze has a No. 6 commercial detonator, containing 15 grains of mercury fulminate, crimped to the stem on the bottom of the body. It is waterproofed by red N.R.C. compound. This fuze required the use of a fuze sealer. Weight of the complete fuze is 3.24 ounces. The fuze provides a delay of 4-5 seconds. This fuze is found in the Mk. II H.E. grenade.

M6 Detonating Fuze

Includes M6A2, M6A3, M6A4, M6A4C, and M6A4D. This fuze is used with grenades filled with high explosive or white phosphorous. Fuze delay is 4-5 seconds. The M6A4C is a modification of the fuze used in the offensive grenade for use in the Mk. 2A1. The "C" designation indicates a curved safety lever. The fuze was also modified for use in the WP grenade, in which case the designation is M6A4D. The "D" indicating a straight safety lever. Versions of this fuze may be found on the Mk. 2A1, Mk. 3A1, M15 or M34 grenades.

M8 Igniting Fuze

Previously known as Fuze assembly, Mk. VIII. This fuze is used only in rifle grenades. The firing of the rifle causes "setback". The setback causes the striker to break the shear wire allowing the striker to hit the primer. The primer flashes and ignites the fuze which begins to burn for a predetermined time, approximately 5 seconds. The fuze burns down and ignites the black powder ignition cup. The black powder ignites the starting mixture which in turn ignites the filling. This fuze will be found in the Grenade, Rifle, Lachrymatory, CN, Mk. II.

M9 Detonating Fuze-

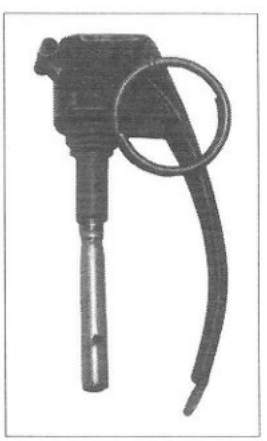
Previously known as Fuze assembly, Mk. IX. This fuze is used only in rifle grenades. The firing of the rifle causes "setback". As with the M8, the setback causes the striker to break the shear wire allowing the striker to hit the primer. The primer flashes and ignites the fuze which begins to burn for a predetermined time, approximately 8.30 seconds. The fuze burns down and ignites the detonator which explodes and bursts the body scattering the filling. This fuze will be found in the Grenade, Rifle, Smoke, FM, Mk. I and Grenade, Rifle, Smoke, WP, Mk. I.

M10 Igniting Fuze- Includes M10, M10A1, M10A2, and M10A3. This fuze gives a delay of 4-5 seconds and is designed for use with grenades having fillers that do not require a detonator. Typical fillings include EC blankfire powder or black powder. The M10 fuze body was styled the same as previous fuses and required the use of a fuze sealer. The M10A1 was declared unsafe for use due to the flame bypassing the Bickford fuze and igniting the igniting charge directly, resulting in an instantaneous explosion of the grenade. The M10A2 remedied this by shortening the Bickford fuze from 2 inches to 15/16 inch and inserting two delay pellets of compressed black powder into the delay train. The delay element on the M10A2 is cut to burn from 4.3 to 5.5 seconds, the element in the M10A3 from 4.0 to 4.8. This fuze may be found on the Mk. II, Mk. 2A1, Mk. II Practice, and M30 Practice grenades.

M200 Igniting Fuze Includes M200A1 and M200A2. This fuze is found in chemical grenades such as the M3, M6 series, M7 series, M8, M14, M16, or M18. Delay is 2-3 seconds.

M201A1 Igniting Fuze This fuze is designed for use with grenades which have fillers that are initiated by burning. The delay element gives a delay of 1.2 to 2 seconds before ignition. The body style was changed at this point to incorporate a protruding "T" lug at the front. The safety lever engages the lug providing a better attachment of lever to fuze. This fuze may be found in the M6 series, M7 series, AN-M8, AN-M14, and the M18 grenades.

M204 Detonating Fuze- Includes M204A1 and M204A2. These fuses will be found on the Mk. 2A1, M26, M26A1, and M61 grenades. It contains a powder train type delay element which burns for 4-5 seconds.



Fuze M204A1

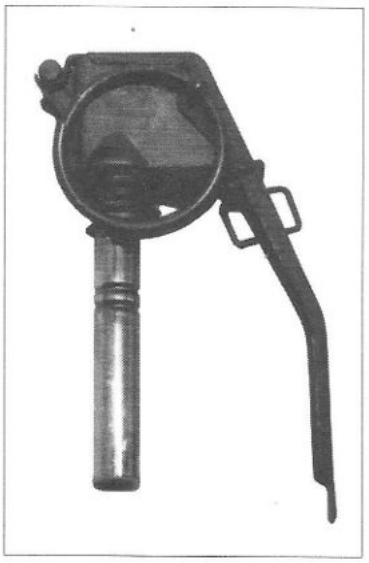
M205 Igniting Fuze- Includes M205A1 and M205A2. This fuze gives a delay of 4-5 seconds and is used in the M30 and M62 Practice grenades.

M206 Detonating Fuze- Includes M206A1 and M206A2. Used with the Mk. 3A2, M15, and M34 grenades. This fuze has a straight type safety lever but otherwise is similar to the M204 series. Delay element is a powder train type which provides a delay of 4-5 seconds.

M213 Detonating Fuze- This fuze has larger threads (5/8-12) than the M204 or M206 series and is therefore not interchangeable in grenades designed for the earlier fuses. It is used in the M33 and M67 grenades.

M215 Detonating Fuze- This fuze has the same threading as the M213 and is interchangeable with it. The main difference is the size and shape of the safety lever. This fuze is used in the M56 grenade.

M217 Detonating Fuze- This is an impact detonating fuze which functions by electrical means. It has the same threading as the M213 and M215 fuses. It is identified by a red safety lever with the word "IMPACT" embossed on it. It may also be found with the lever painted olive drab with the word "IMPACT" embossed on it or painted red with or without "IMPACT" stencilled on in black. This fuze is designed to function on impact to prevent the grenade being thrown back or rolling away from the target on sloping terrain. It functions on impact or after a delay of 4 seconds. The impact fuze does not immediately arm but has an arming delay of 1 second to provide a margin of safety to the thrower. Grenades armed with this fuze should be thrown to a minimum height of 4.5 metres to give the fuze enough time in flight to arm and detonate on impact. This fuze is used in the M26A2, M57, M59, and M68 grenades.



Fuze M228

M226 Igniting Fuze- Used in the M54 grenade.

M227 Igniting Fuze- Used in the M47 and M48 grenades, this fuze has a delay of 2.5-3.5 seconds.

M228 Igniting Fuze- This fuze is designed for used with the M69 Practice grenade. It contains a small spotting charge in place of the detonator to simulate the detonation of a grenade. Fuze delay is 4-5 seconds. May also be found on specially modified M62 grenades.

Markings and Colour Codes

American grenades are identified by the markings and colour code painted on the grenade. Currently grenades have a standard colour coding system but grenades will be found which do not conform to the standard coding. Normally these grenades were produced prior to the Standard system being adopted. This table gives a conversion from the old markings to the newer standard colour coding.

Type	Old Marking	New Marking
Fragmentation, Hand	Yellow body with black markings Olive Drab body with yellow markings	Olive drab body with yellow markings.
Offensive, Hand	Yellow body with black markings Black body with yellow markings	Black body with yellow markings
Illumination, Hand	Unpainted body with black markings	Unpainted body with white band and black markings or all white with black markings
Practice, Hand	Blue body with white markings or no markings	Blue body with brown band and white markings or no markings
Training, Hand	Black body, may have longitudinal white stripes	Blue body with no markings
Smoke, Hand	Grey with yellow marking and yellow band	Light green with black marking, may have white marking, top painted in colour of smoke
Smoke, White Phosphorous, Hand	Grey body with yellow marking and yellow band	Light green with red marking and yellow band
Riot Control, Hand	Grey body with red marking and red band	Grey body with red marking and red band.
Incendiary, Hand	Grey body with purple markings and purple band	Light red body with black markings
Practice, Hand, Chemical	Blue body with white markings	Blue body with white marking and yellow or brown band

Inert, Hand, Chemical	Black body with white markings, brass or bronze fuze assembly	Blue with white markings
High Explosive Anti Tank (HEAT), Rifle	Yellow body with black markings Olive drab body with yellow markings	Black body with yellow markings
Smoke, White Phosphorous, Rifle	Grey with yellow band and yellow markings, Olive drab stabilizer assembly	Light green with light red markings and yellow band
Smoke, Coloured, Rifle	Grey body with yellow markings and yellow band, olive drab stabilizer assembly	Light green with olive drab stabilizer assembly and black or white markings
Practice, Rifle	Black body with white markings	Blue with white markings

As well as the colour coding of grenades, most are also marked on the body with certain information which can be used to further identify the particular grenade. This table gives a few examples of markings found on different grenades.

Designation	GREN HAND FRAG M26A1	M7A3 RIOT
Filling	COMP B	CS
Lot #	PA1-266	21-55-7022

The grenade fuze mechanism will also normally be marked on the top of the safety lever. This table gives a few examples of markings found on the safety levers.

Designation	FUZE M228	FUZE M10A2
Lot #	MEI 2-1	LOT FL-1-58
Date	12-73	

Fillings

As with all countries, American grenades have been filled with many types of explosive and fillings, depending on the use of the grenade. The following list gives some of the fillings used in these grenades.

AC- Hydrocyanic acid. This is a clear, colourless liquid which vaporizes into gas upon release. It is a powerful nerve agent, non-persistent, and has a bitter almond or crushed peach odour. In weak concentrations it will cause dizziness, headache, an unpleasant taste in the mouth, and a rush of blood to the head. In strong concentrations, death is instantaneous.

AW This consists of a mixture of phosphorous and a rubber-gasoline solution. The gasoline mixture will adhere to surfaces while the phosphorous prevents the gasoline mixture from being extinguished with water.

Composition A This explosive filling consists of 91% RDX and 9% wax.

Composition B This explosive filling consists of 60% RDX, 39% TNT, and 1% wax.

CN- Chloracetophenone. This is a lachrymatory (tear) gas which produces severe burning sensations in the eyes. This may be combined with DM.

CS CS has a powerful lachrymatory effect. It is irritating to the upper respiratory tract, causes coughing, difficulty in breathing, and a tightness in the chest. In heavy concentrations it will cause nausea and vomiting. Incapacitation will begin in 15-20 seconds and its duration is less than 10 minutes after removal to fresh air.

CNS- Chloracetophenone solution. This is a mixture of CN in chlorpicrin and chloroform. Chlorpicrin has lachrymatory effects similar to CN.

Coloured Smoke This is a mixture of sulphur, potassium chlorate, sodium bicarbonate, and dye in the desired colour.

DM- Diphenyl amine-chlorarsine. This is a gas which causes a burning sensation in the nose and throat and a tight feeling in the chest. There is also a nauseating effect which depends on the concentration of gas and length of exposure.

EC-Blankfire powder This is a commercial granulated nitrocellulose powder. Generally pink or yellow in colour. It is less powerful than TNT and exploded by ignition rather than detonation. Originally developed for loading in blank ammunition for small arms.

FM- Titanium tetrachloride. A yellowish liquid with a slightly acidic odour. This chemical produces a nontoxic smoke upon contact with the air.

FS- Sulphur trioxide-chlorsulfonic acid mixture. This is a corrosive liquid which reacts with the atmosphere and produces an effective smoke screen.

HC- Hexachlorethane-zinc mixture. This mixture produces a dense cloud of white smoke when ignited. The smoke is harmless in normal concentrations. If this filling comes into contact with moisture, a chemical reaction can occur which causes the filling to spontaneously ignite.

HS- Mustard gas (Dichlorethyl Sulfide). This is a highly persistent casualty producing gas. The gas penetrates clothing and boots producing incapacitating burns on any part of the body the vapours come in contact with. In addition, the gas is highly toxic causing serious casualties even when breathed in minute concentrations. In its pure state, it is a transparent amber, oily liquid. The gas is almost odourless in ordinary field concentrations but in high concentrations has a smell similar to horse radish or mustard.

IM This is a thickened gasoline mixture which will adhere to smooth surfaces.

KJ- Stannic Chloride This produces a gas which is intensely irritating to the eyes and respiratory tract. It caused involuntary tearing and violent coughing.

MI- Chlorvinyldichlorarsine (Lewisite). This liquid gradually changes to a gas. It is extremely vesicant and either the gas or liquid will burn the skin or lungs quite severely. Casualties normally develop several hours after exposure. Grenade filled with this substance are effective in contaminating vehicles or important installations.

NP This is an incendiary filling composed of a mixture of napalm and gasoline. The mixture adheres to smooth surfaces and ignites combustible materials.

RDX A highly sensitive explosive with great shattering effects. Its primary use is in the composite explosives such as Composition A or B.

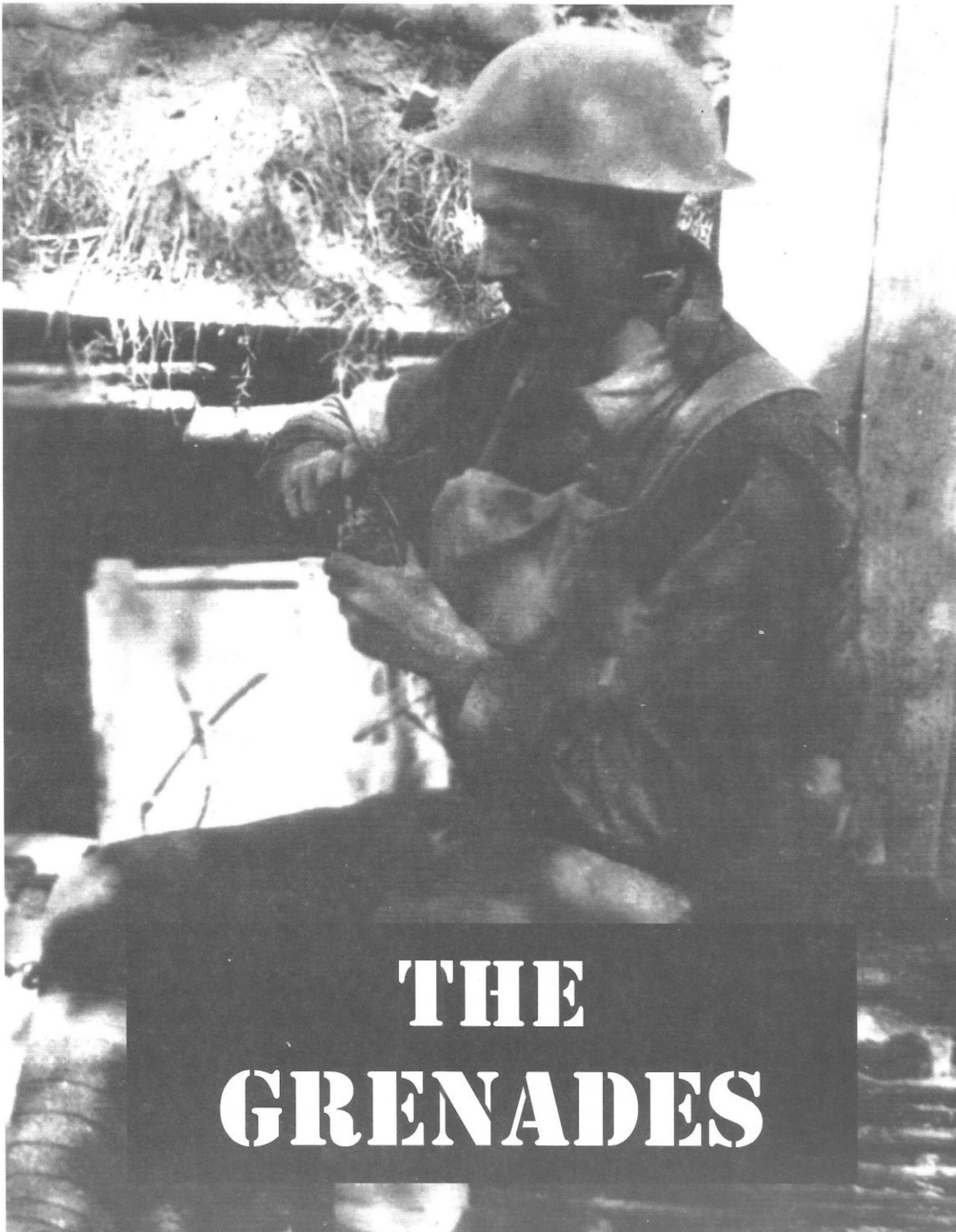
TETRYL This is used alone as a booster charge. It is also used in some composite explosives. It is more sensitive than TNT.

TH- Thermite. Upon ignition Thermite will attain a temperature of 5000 degrees.

TH3- Thermate. This is an improved version of Thermite.

TNT- Trinitrotoluene. This is a stable explosive which must be exploded by detonation.

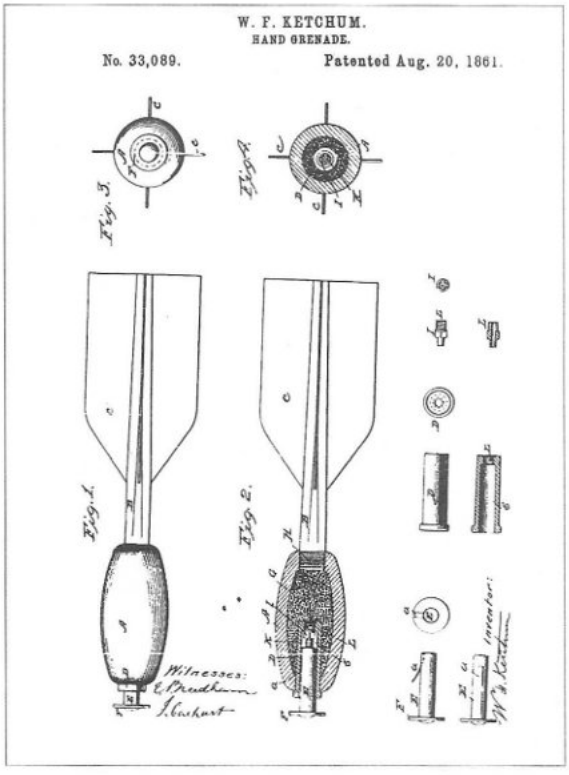
WP- White Phosphorous. This material ignites upon contact with the air, producing a dense white cloud of smoke as it burns. As well as smoke screens, this material has secondary effects of incendiary and anti-personnel.



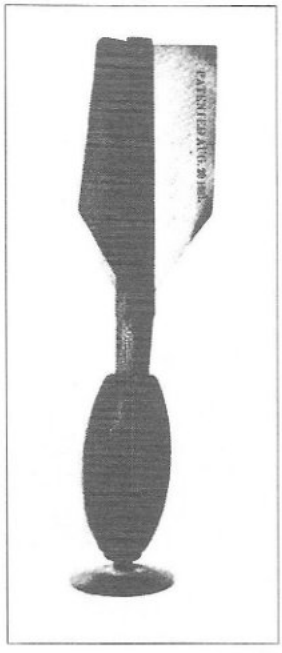
THE GRENADES

"Ketchum Patent"
TYPE - Fragmentation
WEIGHT- Varies
FILLING- Black Powder
IGNITER- Percussion

This is the most common of the Civil War grenades. It was patented by William F. Ketchum on 20 August 1861 (Patent number 33089). The overall appearance of the grenade is that of a large dart. The head is egg shaped, made of cast iron, and has half inch holes in either end. The grenade was made in three versions, differing only in weight, one pound, three pounds, and five pounds.


W. F. KETCHUM.
HAND GRENADE.
No. 33,089. Patented Aug. 20, 1861.

The igniter mechanism is constructed of a tube, about 2 inches long, made of soft metal. The upper end is flanged outward and the bottom end inward. A common musket percussion nipple is screwed into the hole left in the bottom of the tube with the nipple on the inside of the tube. The tube is press fitted into the body until the upper flange rests on the body. A iron plunger with a flange on the top and a small steel spring on one side fits into the top end of the tube. The spring on the side of the plunger retains the plunger in place, preventing it from falling out. The grenade is primed with regular rifle primers using a hollow stick or some such item to hold the primer and place it onto the nipple. After priming the body is filled from the other end and closed by a wooden plug. Priming is done prior to filling the grenade to ensure the grenade cannot explode during the priming process.



The fin assembly consists of cardboard or pasteboard stabilizing fins attached to the bottom of the tail stick. The fins are normally found with the patent date printed on them.

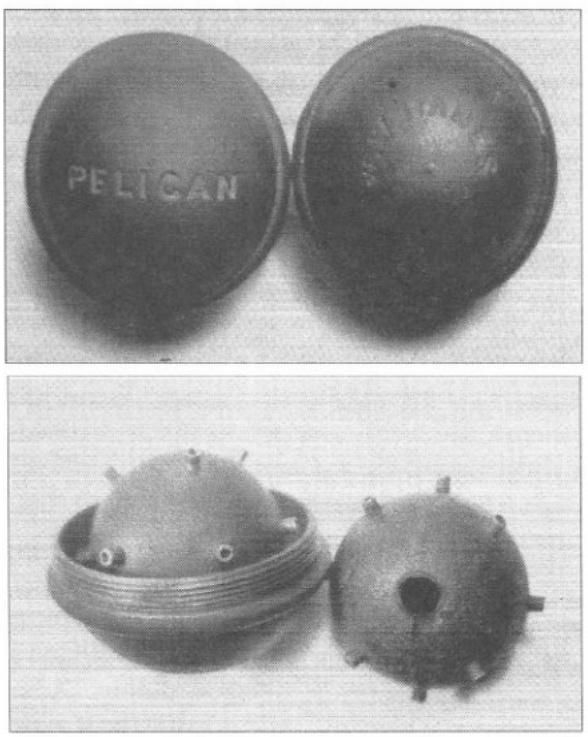
The grenade is stored with the plunger and fins separate from the body and the two holes closed by wooden plugs. The grenade is prepared for use by removing the bottom wooden plug and replacing it with the fin assembly then removing the upper wooden plug and carefully inserting the plunger.

When thrown, the tail and fins assisted the grenade in landing head first. This was required to land head first, and preferably on a hard surface, to ensure ignition. On impact the striker was driven into the grenade, crushing the rifle primer. The primer would ignite, flashing into the main black powder filling and causing the grenade to explode.

This grenade is known to have been used by the Union Army and also was included in the munitions stores of Union ironclads.

"Hanes Patent"
TYPE - Fragmentation
DIAMETER -
Inner sphere 2.5 in.
Outer sphere 3.5 in.
FILLING - Black Powder

This grenade was designed for use during the American Civil War. It was patented by W.W. Hanes on 26 August 1862. The grenade consisted of two cast iron spheres, one fitting inside the other. The outer casing was made in halves to allow priming of the grenade. The inner sphere, containing the black powder charge, has 14 nipples fitted at intervals all over its surface. The grenade was primed by unscrewing and removing the outer sphere, fitting regular rifle primers onto the nipples, and carefully replacing the outer sphere.



Top; Markings of two manufacturers of the Hanes Patent grenade. Bottom; The grenade in its shell.

Two variations have been noted: One with the outer sphere marked "W.W. Hanes Pat. Aug. 26, 62". This variation is fitted with 12 friction fit bronze nipples. The other variant is marked "PELICAN" and has 14 nipples. Parts are inter-changeable between the two versions.

Upon throwing, the impact of the grenade striking the ground would cause at least one of the primers to crush, fire, and so detonate the black powder filling. This grenade would have been extremely dangerous to carry in the primed condition and in fact dangerous to throw. The grenade did not see wide use due to the risk to the user.

"Ganster's Grenade, 1st Pattern"
TYPE- Fragmentation
FILLING- Black Powder
IGNITER- Chemical, Impact

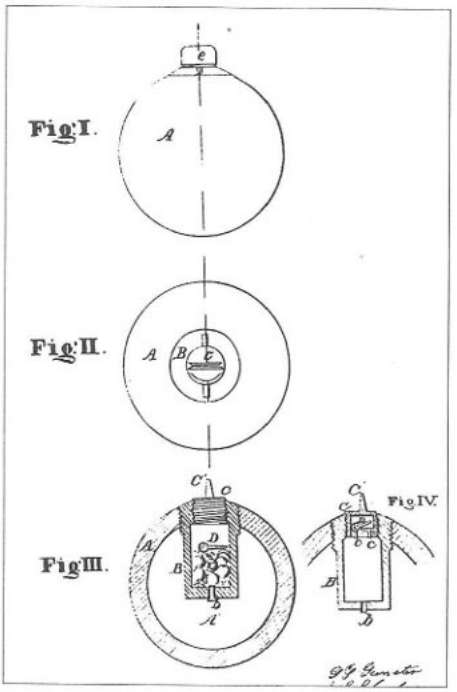
Patented (Number 41615) on 16 February 1864 by George P. Ganster and Isaac S. Schuyler, this Civil War era grenade used an impractical method of ignition. The body was a simple cast iron ball with a large threaded hole in top.

The housing is cylindrical and threaded to match the hole in the body casing. It is closed by a screw plug which may be hollow to contain a vial of acid. Contained in the housing are several steel balls and a quantity of black powder. A hole in the bottom of the housing is sealed by a wooden plug. The igniter operates by the chemical reaction between acid and a mixture of chloride of potash and sulphur. A vial of sulfuric acid, the outside coated with a paste of chloride of potash and sulfur, is inserted into the igniter well just prior to use.

If the vial of acid is contained in a hollow cap the grenade could be safety transported and primed just before use.

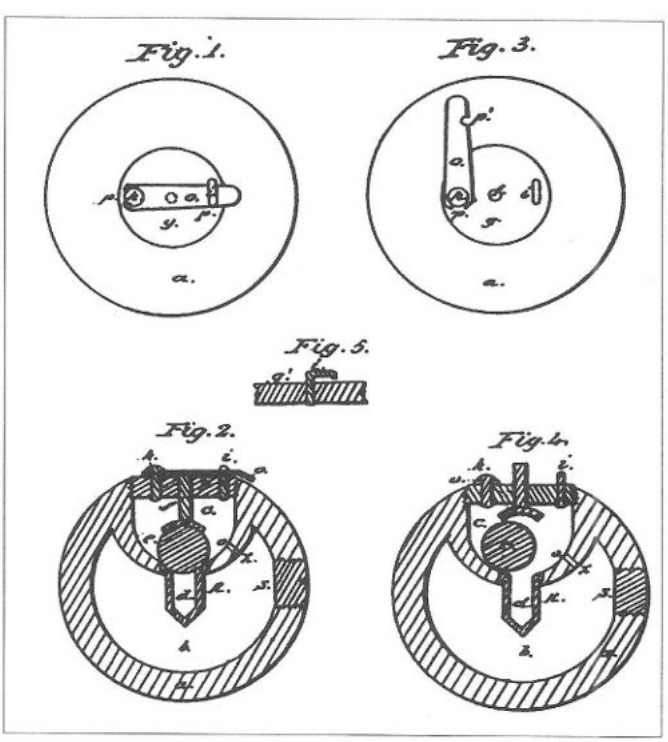
When armed and thrown at the target, upon impact the steel balls would break the vial allowing the acid and paste to contact. The chemical reaction between the two caused a flame, igniting the powder in the igniter housing which was supposed to blow out the wooden plug and ignite the main explosive charge.

It is unlikely this grenade was adopted for use.



"Ganster's Grenade, 2nd Pattern"
TYPE- Fragmentation
FILLING- Black Powder
IGNITER- Chemical, Impact

This is an attempt to improve upon "Ganster's Grenade No. 1". It was patented (number 42363) on 19 April 1864 by George P. Ganster. The main casing is cast with a deep well in the top which is threaded at its upper end to accept a closing plug. A threaded hole in the side of the body is used to fill the grenade and closed by a threaded plug. A hole for a wooden plug and a hole for a vial will be found in the well. The vial in the bottom of the well is filled with sulfuric acid and closed by a stopper coated with beeswax. A pin holds the stopper in place and is in turn held in place by a retaining clip on the closing plug. After the vial and stopper are in place a mixture of chemicals is placed in the well.



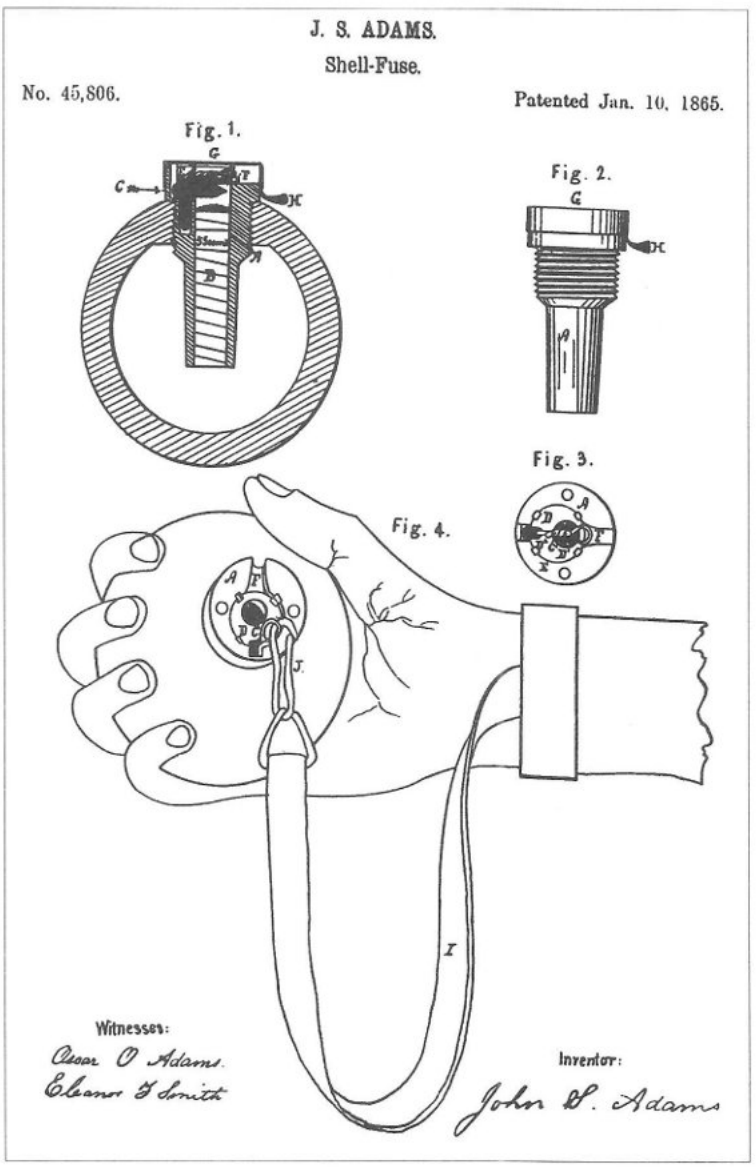
In theory, when the retaining clip is removed and the grenade thrown, the impact will cause the pin and stopper to be dislodged. This allows the chemicals and acid to interact causing a flame or small explosion blowing out the wooden plug and igniting the main explosive charge.

It is unlikely this grenade was any more successful than its predecessor.

"Adam's Patent"
TYPE- Fragmentation
FILLING- Black Powder
IGNITER- Friction
DELAY- 5 sec.

Designed and patented (Patent number 45806) by John S. Adams on 10 January 1865, this grenade was used in the latter part of the Civil War. The body consists of a cannon shell with a threaded hole and a filling of black powder.

The fuse consists of a metallic body with a recessed top and a conical hole drilled longitudinally through the centre. A five second time fuse is inserted in the hole through the top of the body. A recess in the top to the side of the fuse chamber is fitted with a friction primer. A metal disc, with vent hole, is inserted over the fuse and friction primer and staked into position, securing them into the body. The friction wire passes up through a notch in the side of the disc and is bent over toward the opposite side of the fuze with the loop extending into a hook slot. The hook slot is cut into the side of the body to allow attachment of the firing sling. The fuze is then covered by a waterproof cap made of shellacked paper with an opening tape.



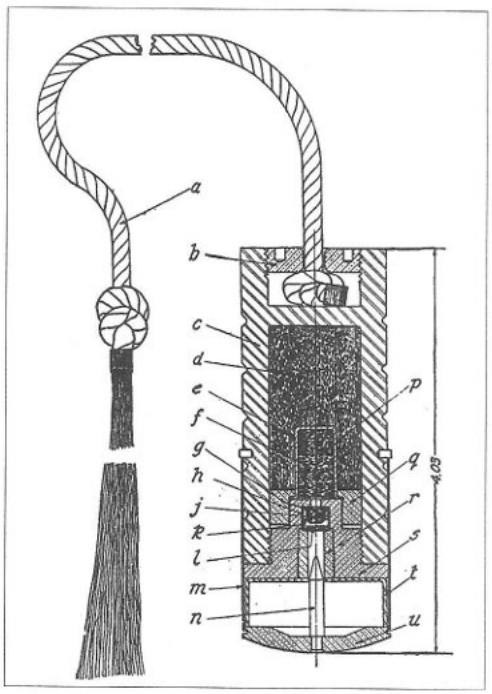
A 18" lanyard with a slip loop on one end and a spring hook on the other was used to ignite the grenade. The lanyard was looped around the wrist of the thrower and the hook end attached to the wire loop of the friction primer. When the grenade was thrown, the lanyard pulled the friction wire of the primer upon reaching the end of its tether. This ignited the 5 second fuse which burned down and detonated the grenade.

Only about 5000 of these grenades were purchased by the U.S. Government.

Cylinder Pattern Grenade
TYPE- Fragmentation
WEIGHT- 1 lb. 5 oz.
LENGTH- 4.03 in.
DIAMETER- 1.5 in.
FILLING- TNT

This pattern of grenade was adopted for use prior to the entry of the United States in the First World War. Whether this grenade ever saw active service during the war is unknown.

The body is constructed in a cylindrical shape of cast iron or steel. The base is hollowed out to a depth of about ½ inch and threaded, the head is hollowed to a depth of about 2.5 inches and threaded at the mouth. The outer surface is grooved to enhance the fragmentation effects. The TNT filler is inserted from the head and

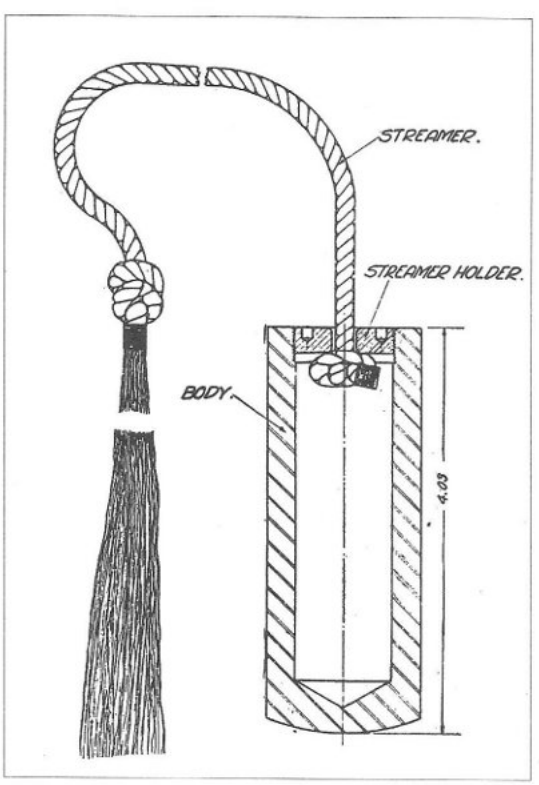


held in place by the detonator sleeve and detonator. The head is sealed by a closing screw containing the primer. The entire head is then covered by a hood which has the striker mounted in a holder and is held in place by a bayonet joint. A safety cup inside the hood prevents the striker from coming into contact with the primer. The base is closed by a plug with the throwing rope/streamer knotted onto it. The throwing rope is knotted near the end with the remaining section unravelled to form a streamer to ensure the grenade lands head first. The grenade must be armed prior to throwing by removing the hood, taking out the safety cup, and replacing the hood with the stud on the body aligned with the longitudinal continuation of the bayonet joint. The grenade should be thrown, using the rope, by swinging it around the head like a sling and releasing the rope at the desired point. If the grenade is swung on a vertical plane the thrower runs the risk of the grenade striking the ground or wall of the trench and detonating while still in his hand. In flight, the rope/streamer trails behind the grenade, steadying it and ensuring it strikes head first. When the grenade strikes the ground the striker is driven into the primer which flashes and fires the detonator.

These grenades were packed in hermetically sealed tin cans provided with tin tearing strips. Four tins are then packed in an olive drab bandoleer. The bandoleers are then packed in wooden cases.

Cylinder Pattern Grenade, Dummy
TYPE- Dummy
WEIGHT- 1 lb. 5 oz.
LENGTH- 4.05 in.
DIAMETER- 1.5 in.

This is the practice version of the "Cylinder Pattern Grenade". It is constructed to closely resemble the live version except the exterior is smooth without the grooving of the live grenade. The body is a one piece bronze casting that has been sufficiently hollowed out enough to match the weight of a live grenade. The hole is then threaded at the base. The body is then closed with a plug with a hole in the centre.



A throwing rope is attached through the centre hole. During use the throwing ropes will become damaged and can easily be replaced by unscrewing the cap, threading a new rope through the hole and knotting it, and then replacing the cap.

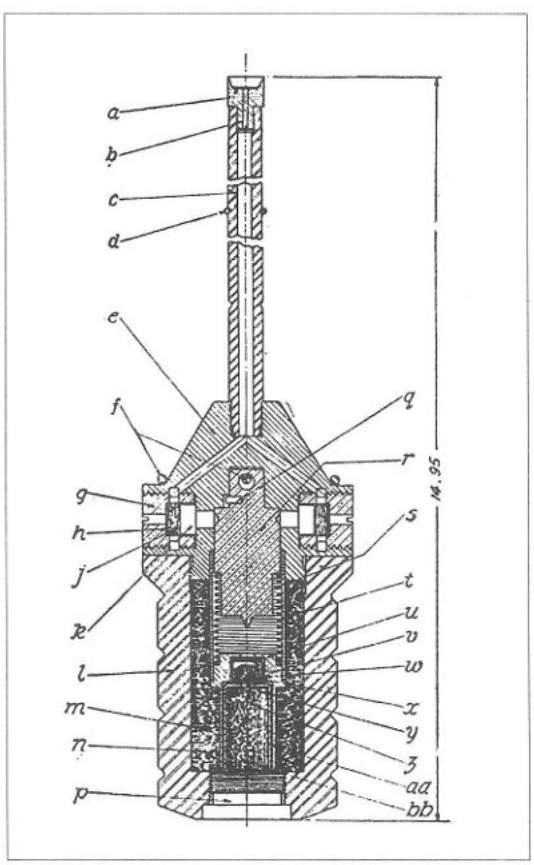
The grenade differs from the live grenade by the smooth body, lack of a hood, and the word "DUMMY" marked on the body.

When issued, each grenade came with 5 extra throwing ropes.

Babbitt Rifle Grenade
TYPE- Rifle, Fragmentation
WEIGHT- 1 lb. 6.84 oz.
LENGTH- 14.95 in.
DIAMETER- 1.9 in.
FILLER- TNT
IGNITER- Impact

This grenade was adopted for launching from the M1903 rifle by the Ordnance Department in 1911. The grenade is overly complicated, would have been difficult to manufacture, and is unlikely that it saw much active service, if any.

The body is grooved to aid in fragmentation, has a large threaded hole in the base, and a smaller threaded hole in the top. The top is closed by a threaded filling plug. The bursting charge, detonator, and primer are contained within the body itself. The base is closed by a large closing screw containing the remainder of the igniter mechanism. A hole in the base of the closing screw fits the stem and two threaded holes in the sides fit the safety pellet screws. Two passages connect the hole in the base with the two threaded holes in the side. The safety pellets, made of compressed rifle powder, hold the safety pins in place, with the points engaging in a groove on the plunger. The plunger has a striker point mounted centrally on its top end. The plunger is retained in place, first by the safety pins, second by a locking pin, and thirdly by a restraining spring. A safety wire fits around the base of the grenade, through a hole in the closing screw and engages the plunger. The stem is hollow, threads into the closing screw, and has a sabot fitted into the lower end. A stem ring fits over the stem to retain the grenade in its proper position on the rifle.



The grenade is designed to be fired at a constant angle of 45 degrees, different ranges are obtained by the length of the stem inserted into the rifle barrel. The stem is grooved at intervals for the different ranges, from 80 to 300 yards. The ranges between 0 and 80 yards may be obtained by holding the rifle at an angle of 80 degrees, with the range obtained being about one fifth of the range marked. When loading the grenade onto the rifle, insert the stem into the barrel and push firmly down until the stem ring engages the groove for the desired range.

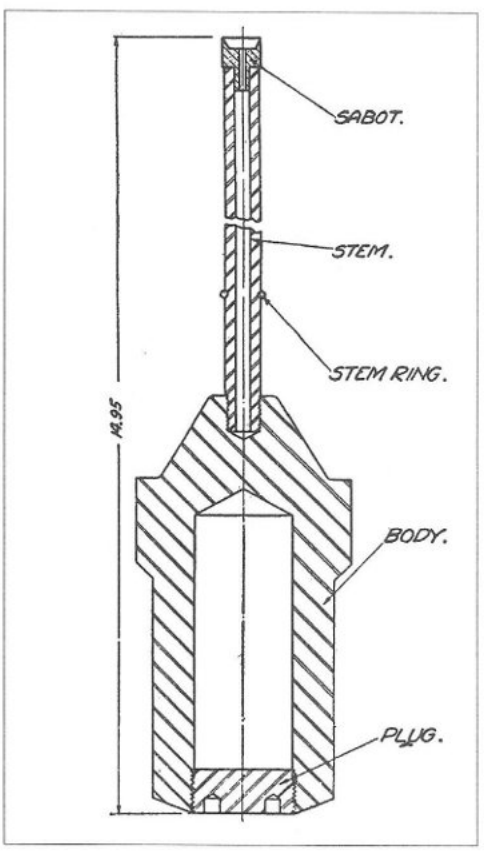
When the rifle is fired, using the special cartridge supplied, the flaming gases push the grenade off the rifle and at the same time arm the fuse. As the flaming gases pass up the rifle barrel, they also pass up through the hole in the stem, up the passages, and ignite the safety

pellets. When the safety pellets are consumed they allow the safety pins to move back out of engagement with the plunger. At this point the plunger is restrained by the plunger spring. When the grenade strikes the ground, the plunger overcomes the resistance of the spring, moves forward, and pushes the striker into the primer. The primer fires, igniting the primer charge which in turn ignites the main TNT charge.

These grenades, with launching cartridge, are packed in hermetically sealed tin cylinders with a tear off strip for opening. Four tins are packed in a bandoleer and 8 bandoleers packed in a wooden case. The case contains a total of 32 grenades and 32 launching cartridges.

Babbitt Rifle Grenade, Dummy
TYPE- Rifle, Dummy
WEIGHT- 1 lb. 6.84 oz.
LENGTH- 14.95 in.
DIAMETER- 1.9 in.

This is the training version of the Babbitt Rifle Grenade. It is used for firing practice to ensure the troops know the proper procedures for loading, aiming, and firing the grenades accurately.



The body is a one piece casting in the shape of the live grenade. The body is smooth on the outside to readily distinguish it from the live version. The centre of the grenade is hollowed out from the top to ensure the grenade has the same weight as a live grenade. The hole is then closed by a threaded plug. A smaller threaded hole in the base accepts the stem which is fitted with a sabot on the end and a stem ring. If the stem becomes damaged during training it may be replaced.

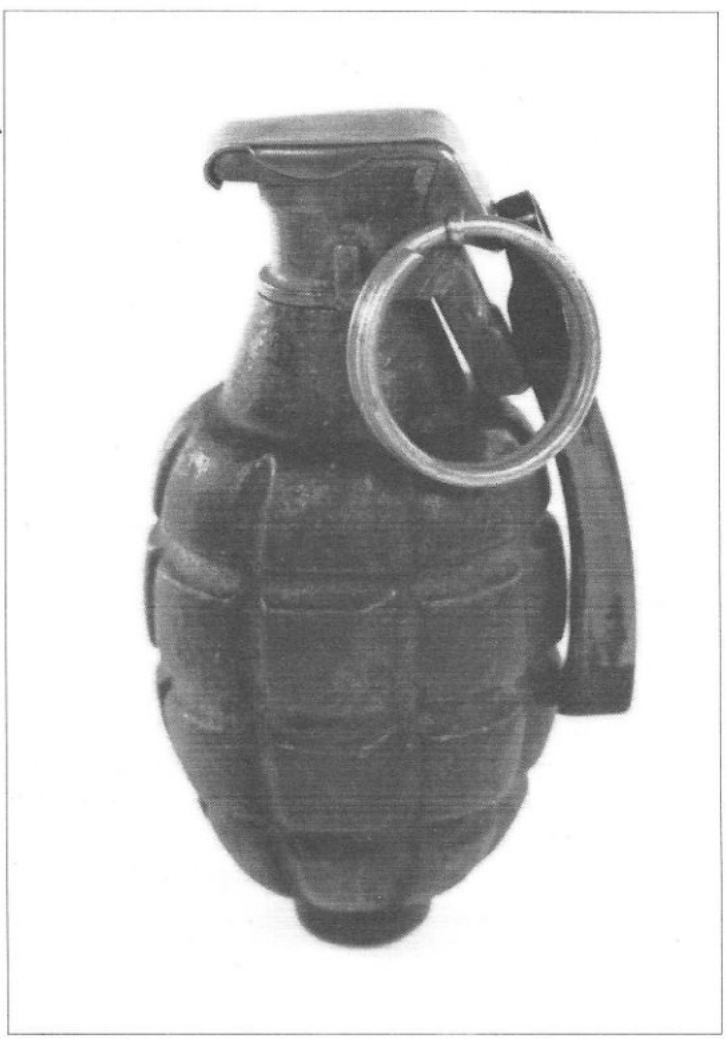
The stem ring engages in grooves around the stem ensuring the stem fits only the required distance into the barrel of the rifle to give the range required. The grenade is used in exactly the same manner as a live version and gives slightly longer ranges due to the closure of the stem at its top end.

The grenades were packed in wooden boxes containing 32 grenades with five extra stems and 50 launching cartridges per grenade.

Defensive Grenade, Mk. I
HEIGHT- 4 5/16 inches
DIAMETER- 2 3/16 inches
WEIGHT- 22 ounces, filled
FILLING- 4 ounces of TNT or Trojan Grenade Powder
EFFECTIVE RADIUS- 75 yards
FUZE DELAY- 5 seconds

When the United States entered the First World War on April 6, 1917, the American Expeditionary Force (AEF) had no reliable grenades of its own. They were quickly armed with French F1, OF1, and Gas grenades, British Mills Bombs and the No. 27 White Phosphorous grenade. By August 1917 the Trench Warfare Section had completed the design and drawings for a new American defensive (fragmentation) grenade. This grenade was modelled on grenades already in use at the front but had radical changes in the igniter mechanism. Improvements in the igniter mechanism were designed to make the grenade safer to use than models currently in use. The grenade was put into production in the US and shipped overseas to the AEF. A cable from the Force on May 9, 1918 in no uncertain terms, condemned the American defensive grenade. The firing mechanism proved to be too complicated, requiring at least five movements to set off the fuze. In the heat of battle troops would not complete the movements required and ended up throwing live but unarmed grenades to the Germans, who could pick them up, complete the operations required, and throw them back. All production was stopped, the firing mechanism redesigned by August 1, 1918 and the new design put into production as the Mk II.

Norm Bonney Collection



The body of the Mk. I is made of malleable iron in a lemon shape. Malleable iron giving better fragmentation than cast iron which has a tendency to pulverize. It is externally segmented dividing it into 40 sections, has a threaded filling hole on the bottom closed by a filling plug, and a larger threaded hole on top for the igniter mechanism.

The "bouchon" is a die casting containing the entire firing mechanism. The upper portion contains the cocking mechanism consisting of a striker, striker spring, hinge pin, lever, and cover. The lever, striker, and cover are all of sheet metal, pressed into shape. The lever restrains the striker in its cocked position and is rivetted onto the bouchon in a manner that allows it to rotate. The cover fits over the top of the bouchon, preventing the lever from rotating and is retained in place by the safety pin. The tubular lower portion contains the detonating group: consisting of a primer, fuze, and detonator. The

primer rests on top of the fuze which is primed with a special compound to ensure ignition. A standard No. 6 fulminate detonator is crimped onto the bottom end of the fuze in such a manner that the diameter of the outside of the crimped portion is the same as the fuze. When assembled into the bouchon the portion of the tube over the detonator is tightly closed to prevent the possibility of an instantaneous explosion from the flame of the primer reaching the detonator without going through the fuze. The grenade is waterproofed by a tinfoil disc shellacked over the primer, cement between the bouchon and grenade body, and cement on the threads of the filling plug.

Normally the grenade body is black, The filling plug is daubed with paint varying in colour depending on the type of filling.

The Mk.I grenade utilizes a safety mechanism which is automatically operated by the act of throwing. It was noted that when grenades are thrown by the overhand throw, the thumb passes obliquely over the body, and with a baseball throw, the fingers pass over a considerable amount of the body. An attempt was made to take advantage of these facts and provide a grenade which will not immediately become a danger to friendly forces if dropped. If the Mk.I grenade is held properly, with the thumb pressed firmly against the lever, the act of throwing will cause the thumb to slip obliquely along the lever, rotating the lever 20 degrees, and freeing the striker. It should be noted that the safety mechanism was not infallible, if dropped, the grenade could land in such a manner to operate the handle and ignite the grenade.

For use, the grenade must be grasped properly, with the thumb firmly against the lever, the safety pin pulled, the cover shaken or pulled off, and the grenade thrown with an overhand or baseball throw. In these circumstances the grenade will operate properly and explode with a force greater than any others in use in France at that time. But, would the grenade operate properly if lobbed with an underhand throw? The fact that at least five operations were required to ignite it that doomed the grenade. In the heat of battle, these operations may be forgotten, the cover left on, the grenade held incorrectly, or thrown incorrectly and a grenade not fully armed, would be thrown at the Germans. Often, the grenade would land, not explode, and could then be picked up, the operations completed, and be thrown back to detonate amongst friendly troops.

Practice Grenades- These are similar in every way to the live versions with the exception that all explosive contents, the detonator, and the fuze are omitted. The filling plug is also eliminated.

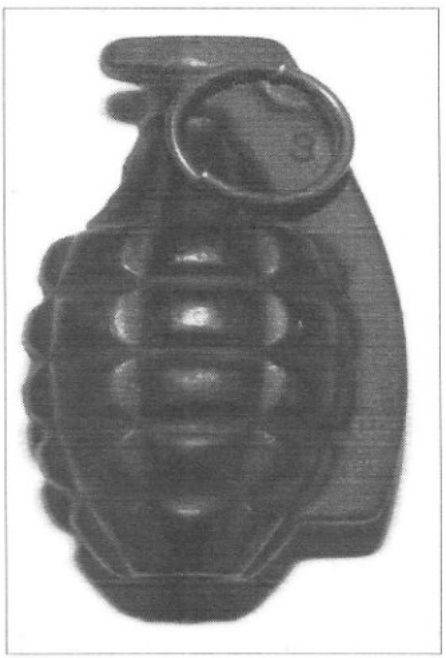
Companies involved with development and production of the Mk.I Grenade include;

Caskey-Dupree Co. of Marietta, Ohio,	-Experimentation, development and production
Gorham Manufacturing Co. , of Providence, R.I.	-Production

Grenade, Hand, Dummy, Mk. I
TYPE- Training
WEIGHT- 21 oz.
HEIGHT- 4.25 in.
DIAMETER- 2.25 in.

This is a one piece casting made of cast iron. It represents the entire Mk. I grenade, including the fuze mechanism. The safety lever is cast onto the body in the same pinched lever style as the live Mk. I grenade. There are two holes in the body, one in the bottom, and the other in the top cone opposite the safety lever. There are no moving parts to this grenade, nor is there a provision for a pin to represent the safety pin. The entire grenade is painted black with no other markings. This grenade is used for practice in the handling of grenades, primarily for throwing practice. If supplies of these dummy grenades were not available, empty fragmentation grenade bodies were used for practice. These may be found painted red.

Grenade, Hand, Training, Mk. 1A1
TYPE- Training
HEIGHT- 4 7/16 in.
DIAMETER- 2 3/16 in.
WEIGHT- 22.0 ounces



This is a training grenade meant to represent the Mk. II series of grenades. It is a totally inert, one piece casting in the shape of the Mk. II. It differs from the Mk.1 in the following: the body is longer, the safety lever casting is longer and not pinched in, the top cone has vertical segmentation, and there is provision for a pin to represent the safety pin. The body is cast iron with holes located in the bottom and in the top cone opposite the safety lever. The grooves on the body are more rounded and the segments more rounded than on the Mk. 1 version. A removable safety pin is fitted in the proper location. The entire grenade is painted black. Some may be found with a white band or other white markings. There is normally a number cast into the body on the left side of the projection representing the safety lever.

These were primarily used for throwing practice but could also be used for primary training in the handling of grenades. The grenades are normally packed in wooden boxes containing 24 grenades.

Rifle Grenade, V.B. Mk. I
TYPE- Rifle, Fragmentation
WEIGHT- 17.25 oz.
LENGTH- 2.5 in.
DIAMETER- 2 in.
DELAY- 8 sec.

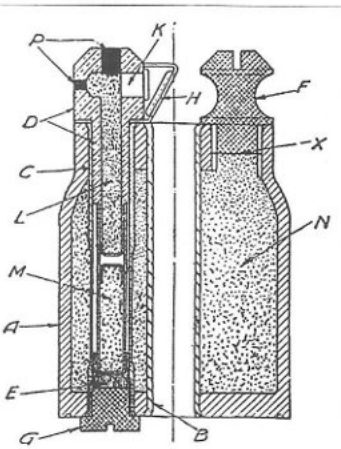
Bob Leiendeckar Collection

This was essentially the French Viven-Bessiere rifle grenade adapted for use with American rifles and ammunition. The body is malleable iron and deeply grooved on the inside, dividing the body into 40 segments. There are two holes machined into the body, a central hole and a lateral hole. Tubes are expanded into the holes forming the central tube and lateral tube. The central tube, which allows passage of the bullet, is made of steel and is bevelled on the inside. The brass lateral tube is of two dimensions, wider at the top where the fuze container is fitted and thinner at the point which contains the detonator. The lateral tube is threaded on the lower end. A screw plug made of lead and a soft rubber cup are fitted into the bottom to retain the detonator in place. The fuze container is brass and has a hole in the side for the primer, a vent hole opposite the primer hole, and a loading hole in the top. The primer hole is closed by the primer and the other two by wax plugs. A sheet steel striker is fitted over the stem of the fuze holder prior to press fitting it into the lateral tube. The detonator has one open end, it is inserted, open end first, through the bottom of the lateral tube with the open end overlapping the stem of the fuze holder. The rubber cup fits over the bottom end of the detonator and the screw plug holds it all in place. A filling hole in the top of the grenade, opposite the fuze holder, is closed by a lead filling plug.

Live grenades are painted grey, the fuze container is brass and unpainted.

The grenade was loaded into the launcher, bottom end first. When the rifle was fired, the bullet, followed by propellant gases travelled up the barrel and entered the central tube. The gases following the bullet could then spread out in the launcher causing the grenade to be launched. The bullet continued up the central tube hitting the striker and driving it into the primer. The primer ignites, blowing out the wax plugs to provide vents, and igniting the delay train. The delay train would burn during the flight of the grenade, eventually reaching the detonator and exploding the grenade. The grenades could be launched from the launcher two at a time.

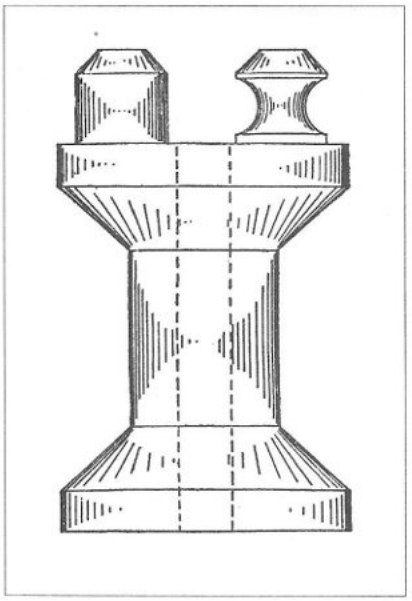
A-	Body	Malleable iron
B-	Bullet tube	Steel
C-	Detonator tube	Brass
D-	Fuze container	Brass
E-	Cup	Vulcanized Rubber
F-	Filling plug	Lead
G-	Screw plug	Lead
H-	Striker	Steel
K-	Primer	Standard
L-	Fuze	Meal and loose powder
M-	Detonator	Standard No. 6
N-	Main charge	TNT
P-	Plugs	wax



By the end of the war some 685,200 grenades had been shipped overseas in preparation for the planned 1919 offensives.

Differences in the French and American grenades are slight. The most obvious are: the body is malleable iron instead of cast iron, the hole through the grenade is smaller, and the striker is a different shape. In addition, the central tube is normally brass in the French grenades and drawn steel in the American version.

Rifle Grenade, V.B. Dummy
TYPE- Dummy/Practice
WEIGHT- 17.25 oz.



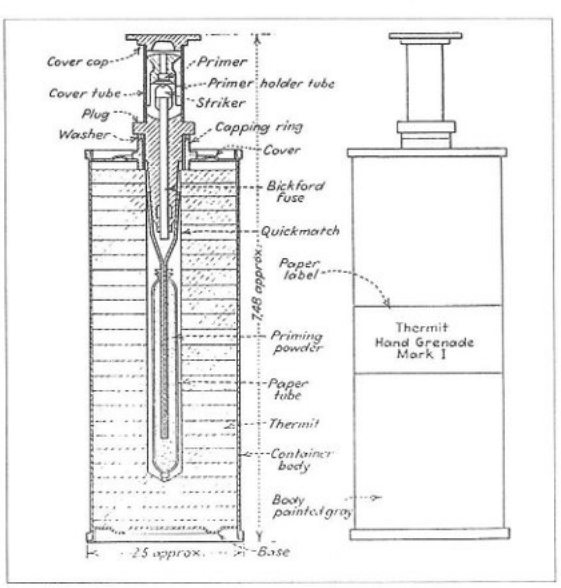
This is the practice version of the Viven-Bessiere rifle grenade as used by American forces. It is a one piece iron casting in the basic shape of the V.B. grenade. The top has projections representing the filling plug and fuse container. The body is turned down in the centre to regulate the weight, making it the same as a live grenade. A hole through the centre represents the central tube and allows the bullet to pass through during firing practice. This grenade may be used many times so long as there is no damage to the central tube or bearing surfaces.

This grenade is used in the same manner as a live grenade providing practice in loading, aiming, and firing of the grenades without the expense of live grenades.

Thermite Hand Grenade Mk. I
TYPE- Incendiary
WEIGHT- 26 oz.
LENGTH- 5 7/8 in.
DIAMETER- 2.5 in.
FUZE DELAY- 5 sec.

This is a direct copy of the French *"Grenade-Incendieres ŕ Main, Mle 1916, Cylindrique"*. The grenades are identical with the exception of markings. Whether the Americans ever actually manufactured this grenade is uncertain. A distinct possibility is that the Americans simply bought grenades from the French and had them specially marked.

The grenade consists of a cylindrical body of tin plate with the ends of the cylinder crimped and soldered on. The body is filled with Thermite covered by special ignition mixture to ensure ignition. The top end has a hole in the centre with a tapped ring soldered into it. A percussion firing mechanism screws into the ring. The igniter consists of a threaded tube containing a 5 second piece of Bickford fuze, a quickmatch, a primer, and a striker. When the striker is hit, it is driven into the primer causing the primer to fire. The primer ignites the Bickford fuze which burns down lighting the quickmatch which then ignites the special ignition mixture, igniting the main Thermite filling.



The grenade is painted grey with a paper label giving the designation of the grenade attached to the outside of the main body.

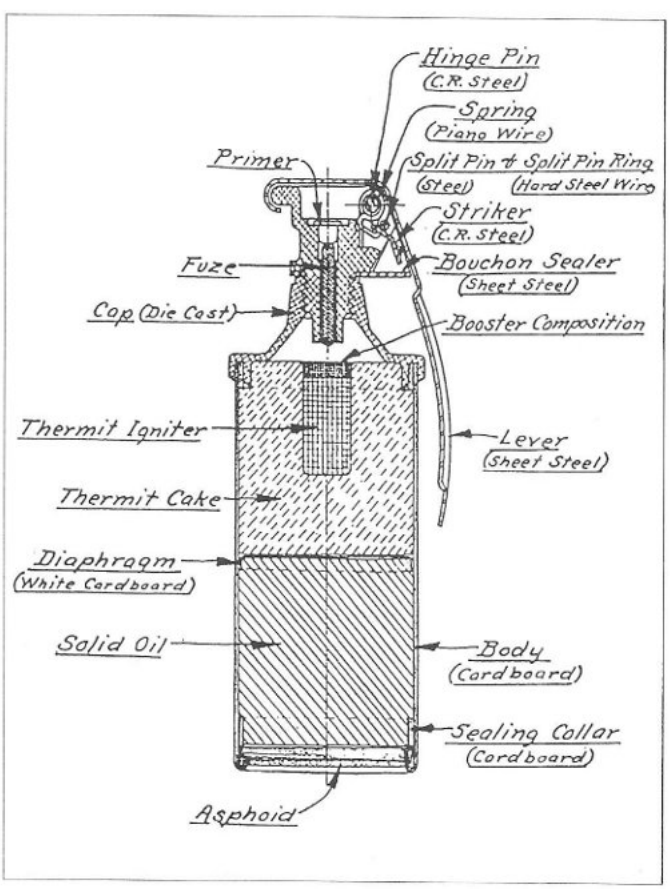
The grenades were packed unfused with a wooden plug in the igniter socket. A wooden box contained 24 grenades and 24 igniter assemblies in a separate compartment within the same box.

For use, the grenade is grasped in one hand, the cover on the firing mechanism removed with the other hand, the firing mechanism struck firmly on any convenient hard object, and the grenade immediately thrown or placed against the object to be destroyed. The five second delay and absence of an explosion allows the grenade to be placed in position rather than thrown. The preferred method of use is to place the grenade.

The Thermite filling burns with an intense heat causing the contents to become a mass of white hot molten metal. This grenade was especially effective for destroying non combustible material such as machine guns or the breech mechanisms of artillery pieces.

Incendiary Hand Grenade, Mk. I
TYPE- Incendiary
WEIGHT- 12 oz.
LENGTH- 3.425 in.
DIAMETER- 1.928 in.
FUZE DELAY- 3.75 sec.
IGNITER- Mk. IV bouchon assembly with special fuze assembly.

This grenade was being developed near the end of the First World War by the Celluloid Co. of Newark N.J. on the instructions of the Chemical Warfare Service. It comprises the same type spirally wound cardboard body as the Mk. III Offensive grenade with the same type diecast top. The body itself differs in one respect, the outer casing was removed. This was found necessary to prevent too much insulating ash forming around the burning contents and reducing its effectiveness. The diecast top differs with the introduction of a 1/4 inch fusible plug in the top. This allows the release of the initial gas pressure generated by the igniter and booster. If the pressure was not relieved a gas explosion could take place and prevent the proper functioning of the grenade. A fuze mechanism, with a Mk. IV bouchon and special fuse assembly, is screwed into the top. The body is filled with solidified oil in the lower half and Thermite in the upper half. A Thermite igniter, consisting of sulphur, potassium nitrate, reduced iron, and covered by a booster composition, is inserted in the centre of the Thermite filling, directly below the delay element of the fuze mechanism. A cardboard diaphragm coated with shellac separates the two fillings. The solidified oil is encased in a celluloid container to prevent the oil contaminating the Thermite mixture.

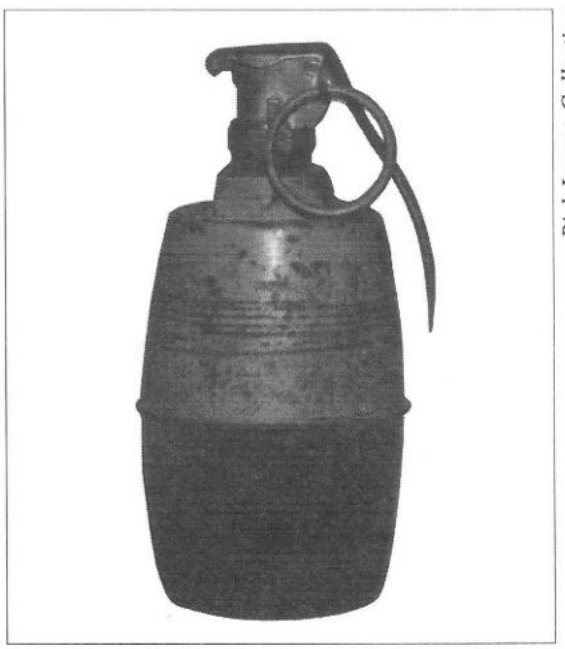


When ignited the grenade will burn for three to four minutes.

The grenades were packed with a wooden plug screwed into the fuze well. The fuze mechanism must be inserted prior to use. 48 grenades were packed in a wooden box. Fuses were packed separately in a wooden box containing 384 assemblies.

This grenade never made it into general use, experimental quantities were sent overseas for trial, but the war ended prior to general acceptance. The officers of the American Expeditionary Forces did not believe this type of grenade to be very useful. The Chemical Warfare Service however, felt the grenade should be produced and ordered 81000 grenades from the Celluloid Co., of Newark, N.J.

Smoke Hand Grenade, BM, Mk. I
TYPE- Smoke
WEIGHT- 30 oz.
HEIGHT- 4 7/16 in.
DIAMETER- 2 11/16 in.
FILLING- BM Smoke Mixture
IGNITER- Mk. II



Rick Larson Collection

This grenade was developed during the First World War. The body is of "terne plate" in a semi-ovoid shape with a smooth surface. It is constructed of two cups welded together in the middle. The top cup has a fuze adapter welded onto it. Fusible plugs are evenly spaced around the fuze adapter. The fuze mechanism is of the Mk. II style and gives a delay of 5 seconds.

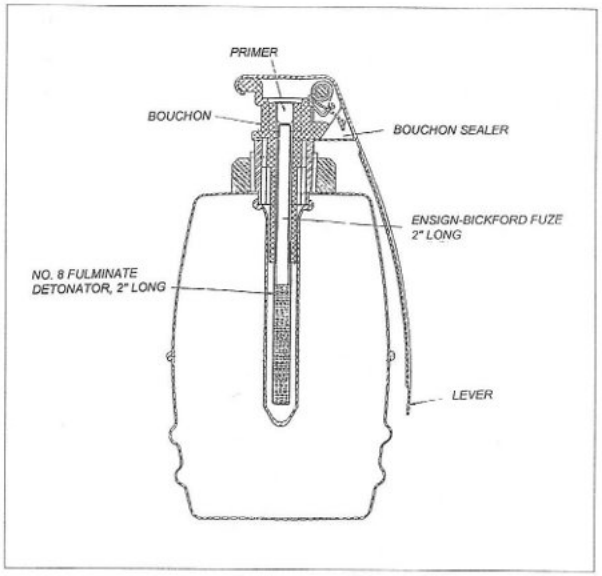
These grenades were packed separately from the fuze mechanisms. A wooden plug closes the fuze well during storage and must be removed and replaced with the fuze mechanism prior to use. Grenades were packed 24 to a wooden box, the fuze mechanisms 192 to a wooden box.

This grenade was developed and tested but never went into production, the Phosphorous grenade being adopted as the standard smoke grenade of the time.

Gas Hand Grenade, HS, Mk. I
TYPE- Gas (Casualty)
HEIGHT- 4 7/16 in.
DIAMETER- 2.75 in.
FILLING- HS (Mustard) Gas

This grenade is constructed of two stamped steel cups welded together in the middle. The top cup has a fuze adapter welded onto the top. A detonator thimble fits into the fuze adapter sealing the filling into the body. The Mk. II fuze mechanism then screws into the adapter. Since this grenade has a detonator the fuze mechanisms and grenade bodies were stored separately. The fuze well in the body was closed by a wooden plug which was removed and discarded when the grenade was fused.

This grenade is filled with HS gas, otherwise known as Mustard Gas (Dichlorethyl Sulfide). This is a highly persistent casualty producing gas. The gas will penetrate clothing and boots producing incapacitating burns on any part of the body the vapours come in contact



with. In addition, the gas is highly toxic causing serious casualties even when inhaled in minute concentrations. In its pure state, it is a transparent amber, oily liquid. The gas is almost odourless in ordinary field concentrations but in high concentrations has a smell similar to horse radish or mustard.

For markings the grenade would have two green bands to indicate a persistent vesicant gas.

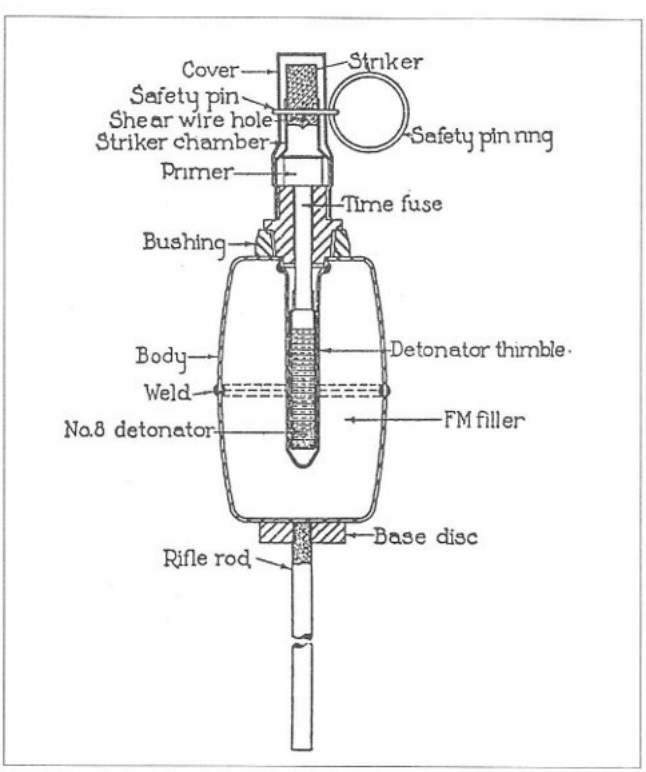
The grenades were packed in wooden boxes containing 24 grenades. Fuze mechanisms were packed separately with 192 assemblies in a wooden box.

Developed during the First World War, this grenade did not go into production.

Grenade, Rifle, Smoke, FM, Mk. I

TYPE- Rifle, Smoke
WEIGHT- 16 oz.
FILLING- 9 oz. "FM" Titanium tetrachloride
IGNITER- M9

This grenade uses the same body as the "Smoke Hand Grenade FM, Mk. II". The body is made of two sheet steel cups welded together in the middle. A drawn steel detonator thimble is fitted through a hole in the top cup and sealed to contain the filling. A steel bushing attached to the top of the grenade is internally threaded to accept the igniter mechanism. No adapter is required with this fuze mechanism. A steel base disc with a threaded hole in the centre is attached to the bottom. A 15 inch steel launching rod screws into the base disc.



The fuze mechanism is of the percussion type. It consists of a base containing a delay element with a No. 8 detonator crimped on the end of the fuze. The upper portion of the fuze consists of a tube containing a primer, striker, shear wire, and safety pin. The entire mechanism is then covered by a thin sheet metal cap with the safety pin fitting through the cap, sides of the tube, and striker.

The grenade is painted grey with a half inch yellow band. The grenade is also marked "FM" above the band, "SMOKE" below the band, and the lot number below that. All markings are in yellow.

When the safety pin is pulled the striker is held in position by the shear wire. On firing, the setback caused by the shock of firing causes the striker to break the shear wire, move down the tube and hit the primer. The primer fires igniting the delay fuze which burns down to the detonator and sets it off. The grenade will

produce a dense cloud of white smoke of good obscuring power.

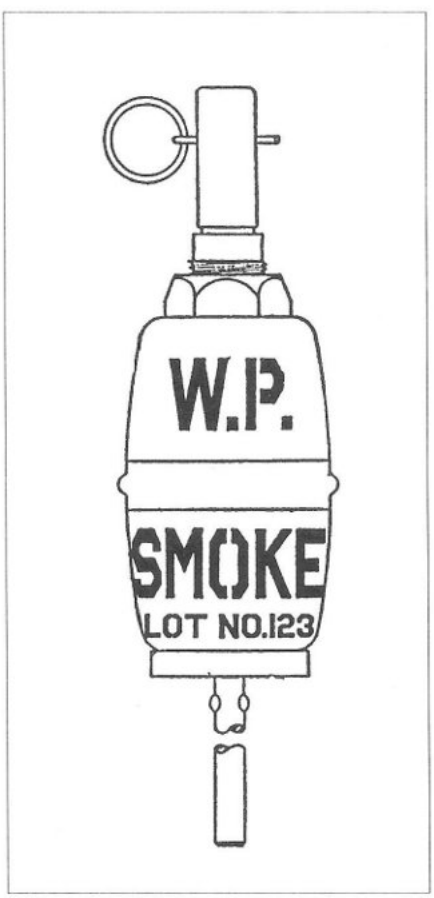
It appears that this grenade could be used by hand if necessary. By removing the launching rod, pulling the safety pin and striking the head of the grenade on a hard object, the striker would be driven into the primer starting the delay element. The grenade would then be thrown immediately. This grenade was issued unfused with a wooden shipping plug closing the detonator thimble during storage. Method of fusing was as for the hand version. The grenades were packed in wooden boxes containing 24 grenades. The launching rods and launching cartridges were issued separately. The fuses were packed in small tins containing 12 fuses with 20 tins packed in wooden cases giving a total of 240 fuses per case.

Its maximum range when fired from the rifle is 265 yards.

The grenade was intended primarily for training. Due to the dangers involved with using white phosphorous grenades in training it was decided to produce a grenade for training which eliminated some of the dangers. White phosphorous constitutes a danger of casualties from flying pieces of white phosphorous as well as a serious fire hazard when used in dry grass or near other combustible materials. The filling in this grenade, titanium tetrachloride, poses no risk of casualty other than to the eyes, and does not constitute a fire hazard.

Grenade, Rifle, Smoke, WP, Mk. I
TYPE- Smoke
WEIGHT- 15.5 oz.
FILLING- 6 oz. White Phosphorous
IGNITER- M9

The body is constructed of 2 thin sheet steel cups welded together with a steel base disk soldered to the bottom of the body. A threaded bushing is welded to the top of the body. The threading in the bushing is tapered (pipe threaded). A detonator thimble assembly, consisting of a thimble and a socket, screws into the bushing providing an air tight seal. Threading on the inside of the thimble accepts the fuze. The launching rod screws into a hole in the centre of the base disk. The base disk provides a method of attachment for the launching rod and prevents the bottom of the grenade from crushing in upon firing. The launching rod is 15 inches long and has two small projections formed just below the threading. The rod is zinc or copper coated to resist rust.



The body, including the bushing and thimble is painted grey. A half- inch yellow band is painted around the centre. Other markings are also in yellow and consist of "WP" above the band, "SMOKE" below the band, and below that the lot number.

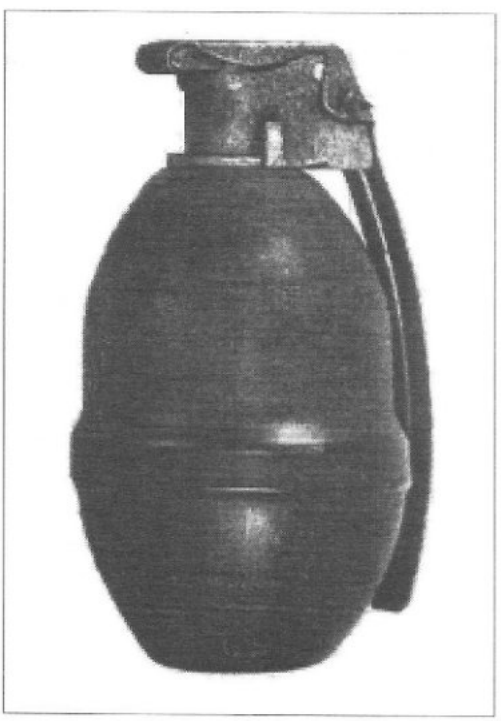
When the grenade is fired, the setback causes the striker to break the shear wire allowing the striker to hit the primer. The primer flashes and ignites the fuze which begins to burn for approximately 8.3 seconds. The fuze burns down and ignites the detonator which explodes and bursts the body scattering the filling. It would appear that the grenade could also be used by hand.

The grenade is designed to produce obscuring smoke screens. It also has a limited incendiary effect and the flying fragments of white phosphorous are very effective against personnel.

This grenade was issued unfused with a wooden shipping plug closing the detonator thimble during storage. The method of fusing was as for the hand version. The grenades were packed in wood boxes, each containing 24 grenades. The launching rods and launching cartridges were issued separately. The fuses were packed in small tins containing 12 fuses with 20 tins packed in wooden cases giving a total of 240 fuses per case.

Grenade, Hand, Illuminating, Mk. 1
TYPE- Illumination
WEIGHT- 10 oz.
LENGTH- 4.35 in.
DIAMETER- 2.19 in.
FUSE DELAY- 7 sec.
FILLER- 3.5 oz. Illumination Compound

This grenade is primarily designed for signalling or to provide battlefield illumination. Due to the high heat produced by the illumination compound the grenade also has a limited incendiary effect. The grenade casing is constructed of rolled sheet steel in two parts, joined at the centre. The charge is contained in the lower half of the casing and covered with a layer of first fire composition. The fuze mechanism screws into an adapter mounted in the top half. When the safety lever is released, the striker rotates on its axis pin and hits the primer which then ignites the quick-match. The quick match burns for seven seconds then ignites the ignition charge which, in turn, ignites the first fire composition. The first fire composition then ignites the main illumination charge. Upon ignition the upper half of the grenade separates from the lower half under pressure from the gases



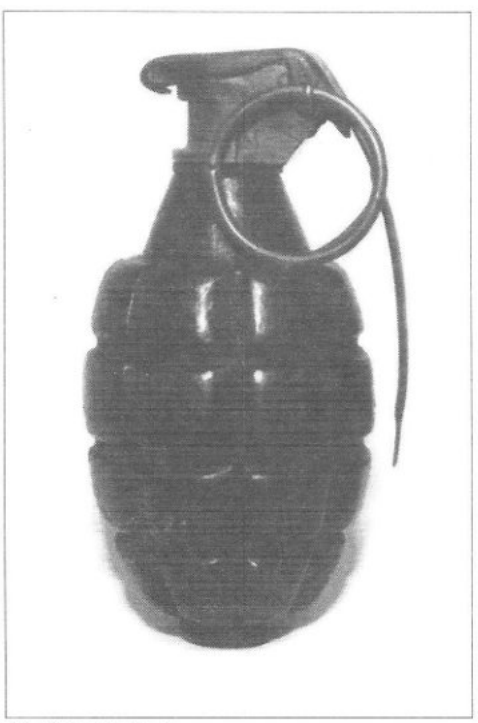
produced by the burning illumination charge. When the two halves separate they can be ejected up to 30 metres. The grenade may be found painted white with black markings or unpainted with a white band and black markings. It may also be found painted olive drab with white markings. The safety lever is white or olive drab with black markings.

The grenade is packed in individual fibre containers within an outer wooden packing case containing 25 grenades.

The grenade is best employed using a trip wire. A light source laying on the ground produces a lot of ground shadows. This can be minimized by the proper placement of the grenade and the use of a trip wire can ensure the grenade remains in place to minimize the ground shadows. The grenade burns for 25 seconds producing 55,000 candle power. With good placement this grenade could illuminate an area 200 metres is diameter.

Grenade, Defensive, Mk. II
TYPE- Fragmentation
WEIGHT- 22 oz.
HEIGHT- 4 7/16 in.
DIAMETER- 2 3/16 in.
FILLING- Trojan Grenade Powder
FUZE DELAY- 4-5 sec.
IGNITER- Mk. II

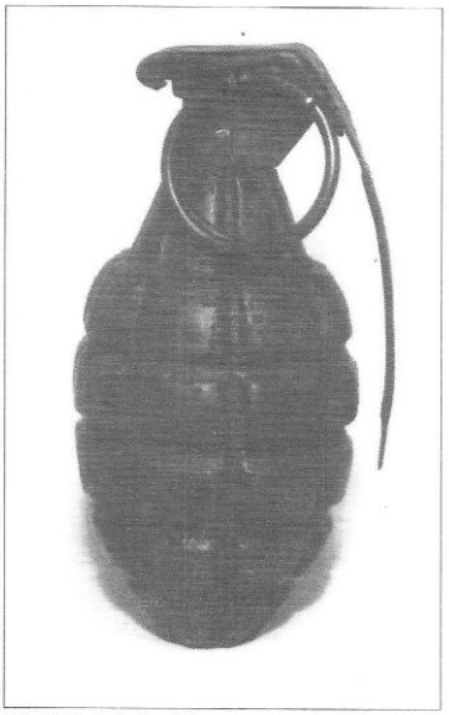
With the demise of the Mk. I Grenade in May 1918, the American Expeditionary Force was again without its own defensive grenade. With an American offensive planned for the spring of 1919 it was imperative that a new grenade be designed and produced without delay. American industry proved to be up to the task and, by August 1, 1918 the new grenade was on paper and much of the new machinery produced and installed. Initial orders called for 44 million of the defensive grenades. A daily production figure of 250,000 to 300,000 grenades was reached by November 11, 1918. By December 6, 1918 the factories had produced over 21 million Mk. II grenades. According to records, only 516,533 of these grenades were actually sent overseas. This grenade eliminated the objectionable features on the Mk. I and was favourably accepted by the American Expeditionary Force.



Mark I style body

The Mk. II Grenade initially used recovered Mk. I bodies. After the Mk. I bodies were used up the body was slightly redesigned with more taper to the body and a flat base. The Mk. II body is made of cast iron, externally segmented, with threaded holes in both top and

bottom. The top "cone" of the body is slightly grooved. The body is waterproofed by a non-acid black paint or transparent varnish. When fully assembled the upper half of the grenade is dipped in an anti-rust compound and asphaltum is coated on the threads of the fuze mechanism and filling plug.



Mark II style body

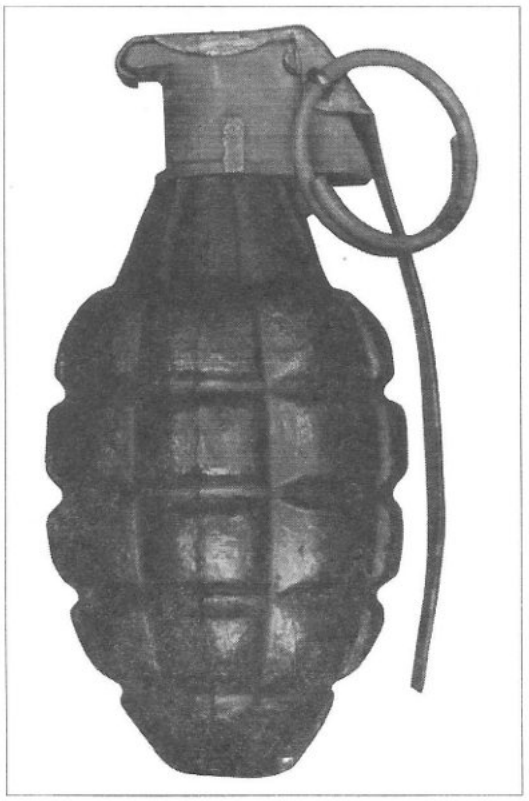
The fuze mechanism is modified from that of the Mk. I. A new safety lever was designed, incorporating the cover and lever into a single piece. The lever fits over the top, holding the striker in the cocked position, and pivots around a projection on the front of the bouchon. The safety pin fits through holes in the lever and bouchon retaining the lever in place and blocking movement of the striker. The primer is mounted in the bouchon and covered by a tin foil disc. A fuze assembly, consisting of Bickford fuze, priming powder, and a No. 6 fulminate detonator is fitted and crimped into the bottom stem of the bouchon. When assembled, a fuze sealer is inserted between the bouchon and grenade body, sealing the bottom of the fuze mechanism. This Mk. II fuze mechanism was used on all American grenades during the First World War, including, Offensive, Gas, and White Phosphorous. Fillings consisted of 2 ounces of TNT or Trojan Grenade Powder, both high explosives. The 3/8 inch filling hole in the bottom is closed by a threaded plug.

The grenade is held firmly in the hand with the lever in the palm of the hand. Ensuring the lever is held down, pull the safety pin out, the grenade is then considered armed. When thrown, the striker rotates forward throwing the lever off, as it continues forward the striker pierces the tin foil disc and ignites the primer. The primer ignites the 5 second delay fuze which burns down to set off the detonator.

When loaded the grenade will be painted grey or have a grey paint mark on it.

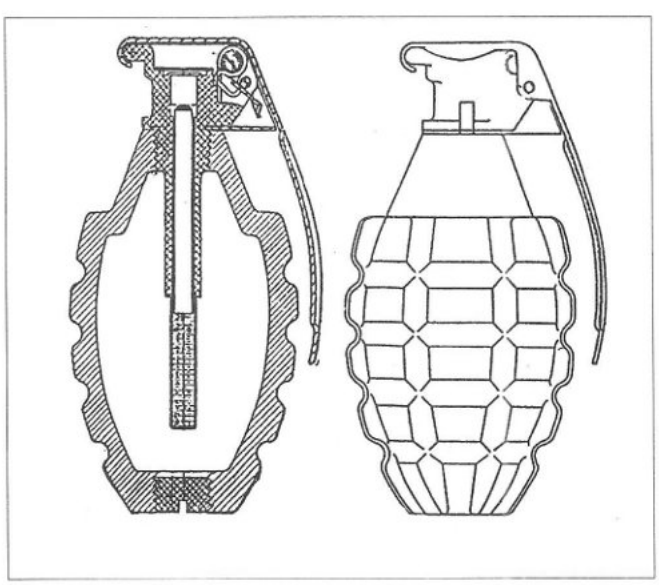
The companies involved with developing and producing the Mk. II grenade are: Caskey-Dupree Co., Spacke Machine & Tool Co., Stewart-Warner Speedometer Co., Miami Cycle & Manufacturing Co., American Radiator Co., International Harvester Co., Doehler Die Casting Co., and Precision Castings Co.

Grenade, Hand, Fragmentation, HE, Mk. II
TYPE- Fragmentation
WEIGHT- 22 ounces
FILLING- 1.85 ounces TNT
DANGER RADIUS- 30 yds.
FUZE DELAY- 4-5 seconds
IGNITER- M5



This is a modification of the original "Defensive Grenade Mk. II" adapted for the M5 Detonating Fuze. The body and filling of high explosive remained basically the same. This grenade was stored and issued unfuzed with the grenade body and fuze separated due to the use of M5 detonating fuzes. If one grenade is set off it will detonate adjacent grenades, separating fuze from body pre-vented this. The grenade body was closed by a wooden shipping plug screwed into the top. This grenade was used during the interwar years and the early stages of World War II.

The body of the grenade is painted yellow and may have a letter or symbol moulded in the side indicating the manufacturer of the casting.



This grenade must be fuzed prior to use, to accomplish this:
- Unscrew and remove the wooden shipping plug.
- Examine the cavity in the explosive, if it is blocked or not of sufficient size to receive the fuze without friction, use a wooden stick of about 1/4 inch diameter to enlarge it.
-Ensure the fuze sealer and washer are in place and insert the fuze.
-Holding the fuze stationary, screw the grenade body onto it.
-Tighten the fuze using the wrench provided.

The grenades were packed unfuzed in wooden boxes with inner partitions and rope handles on each end. Each wooden box contained 24 grenade bodies. Fuzes were issued in boxes of 384 with enough fuze sealers and composition washers for each fuze. A spanner wrench for tightening the fuze into the grenade body was supplied in each box.

Grenade, Hand, Fragmentation, Mk. II
TYPE- Fragmentation
WEIGHT- 20 ounces
FILLING- 0.74 ounce EC Blankfire
Powder
DANGER RADIUS- 30 yds.
FUZE DELAY- 4-5 seconds
IGNITER- M10, M10A1 or M10A2

At this point in the evolution of the grenade it appears that the body style was changed slightly. The body is grooved more deeply, the taper is slightly less, and the base is flatter. The filling hole is tapped with 3/8-inch tapered pipe threads and is closed with a die cast screw. This grenade has a filling of 0.74 ounce of EC Blankfire Powder, a low ex-plosive, and uses the M10 series igniting fuze. With the use of the M10 series of fuze mechanisms, the striker lever was lengthened about one inch. While the effective radius of the grenade is 30 yards, some fragments may fly up to 200 yards. This modified version served American forces throughout the Second World War.

Chris Arnold Collection

The body of this grenade is painted yellow and may have a letter or symbol moulded into the side indicating the manufacturer of the casting. The safety lever is normally stamped with the fuze model, lot number, and loaders initials. The colour scheme for these grenades changed in 1943 to an olive drab body with a yellow band.

This grenade was issued fuzed and ready for use. It is packed in a standard metal lined wooden box containing 10 grenades. The box is marked with the model, lot number, packing date, weight, and size.

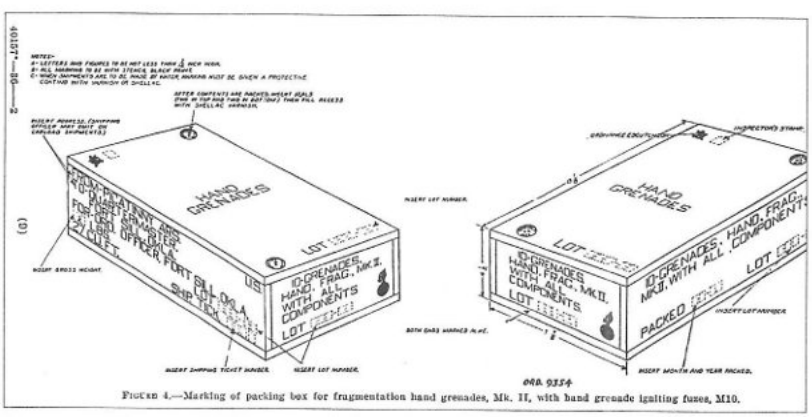


FIGURE 4.—Marking of packing box for fragmentation hand grenades, Mk. II, with hand grenade igniting fuses, M10.

Grenade, Hand, Practice, Mk. II
TYPE- Practice
WEIGHT- 20.5 oz.
FILLING Black powder
FUZE DELAY- 4-5 seconds
IGNITER- Mk. II, M5, M10A1 or M10A3

This practice grenade uses a standard Mk. II body with the filling hole plug removed and all fillings removed. Initially the fuze was a standard Mk. II style with a No. 6 commercial detonator. It can also be found with the M5 detonating fuze. The Mk. II fuze mechanism was, by this time, obsolete. Use of the fuze as a practice fuze was a method of using them up and retaining more modern fuzes for use with live grenades. The body was not closed at the bottom end by either the filling plug or a cork. The detonation of the grenade produces a sharp report accompanied by smoke.

Once the Mk. II and M5 fuze mechanisms were used up the grenade was fitted with the M10, M10A1 or M10A3 igniting fuze. With this

fuze a small charge was required to produce a report and smoke to indicate the explosion of the grenade. The filling is a small charge of black powder in a paper tube or cloth bag which is inserted through the filling hole after the grenade is assembled with the fuze. When the charge in a paper tube is used, the tube is inserted over the igniter of the fuze and held in place by a cork. The filling hole is kept closed by a cork after assembly.

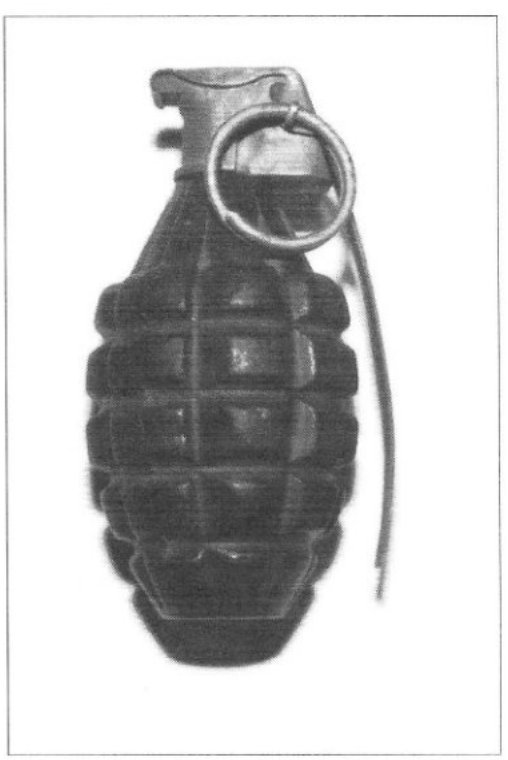
The body of this grenade is light blue and may have a letter or symbol molded into the side indicating the manufacturer of the casting. The safety lever is normally stamped with the fuze model, manufacturers initials, and lot number.

This was a standard grenade used for practice and training. Upon detonation the cork would be blown out of the grenade and a puff of white smoke produced simulating the detonation of a live grenade.

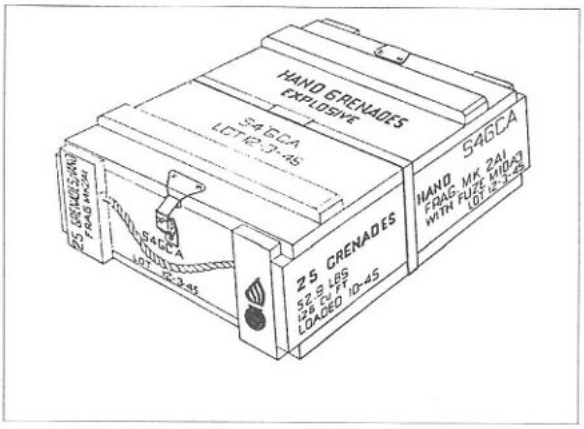
The practice grenades were issued fuzed and ready for use. They were packed in boxes of 24 with the box clearly marked as containing practice grenades. The grenade bodies could be re-used simply by checking the body for damage and replacing the fuze mechanism and practice charge.

Grenade, Hand, Fragmentation, Mk. 2A1
TYPE- Fragmentation
HEIGHT- 4.5 inches
DIAMETER- 2.25 inches
WEIGHT- 21 ounces
IGNITER- M10A2, M10A3, M6A4C, M204A1, or M204A2
FUZE DELAY- 4-5 seconds
FILLING- 2 oz TNT or .74oz. EC Blankfire Powder.
EFFECTIVE DANGER RADIUS- 10 metres

The Mk. 2A1 is a modification of the Mk. II. It served American forces in late World War 2, Korea, and the initial stages of the Vietnam War. It will still be found in service throughout the third world. The body differs from the Mk. II mainly by the absence of the filling hole in the bottom. The basic shape has stayed the same – it is still cast iron and is still externally segmented. The top "cone" has the vertical grooves of the body extended up onto the cone.



The Mk. 2A1 was originally filled with 0.74 ounces of EC Blankfire powder. This filling does not require a detonator, instead using an igniting fuze, either M10A2 or M10A3. The filling was later changed to a mixture of flaked and granular TNT, a high explosive, which requires a detonator. In this case the grenade may be found with the M6A4C, M204A1, or M204A2 detonating fuze.



The grenade is painted olive green with a thin yellow band around the top of the body. The yellow band indicates a filling of high explosive. Other markings appear on top of the safety lever, giving the fuze designation, manufacturers mark, lot number, and date of manufacture. The body will be found with markings cast into the sides, varying with manufacturers as will the quality of the casting.

Fitting an M1 adapter onto the grenade allows this grenade to be launched from a spigot type grenade launcher. It can also be used with the M1A1 or M1A2 adapters in the same manner.

These grenades are packed in individual containers (M41 or M41A2) in wooden crates containing 25 grenades. The crate is unpainted, with black markings. Markings include the stock number, grenade designation, quantity, type of fuze, lot number, loading date, weight, and size of the case.

Phosphorous Hand Grenade, Mk. II

TYPE- Smoke (Phosphorous)
WEIGHT- 19 oz.
HEIGHT- Body only , 3 13/16 in.
DIAMETER- 2 1/8 in.
FILLING- 10 oz. Phosphorous
IGNITER- Mk. 2

The design of this grenade was ready in January of 1918. The grenade closely resembled the gas grenade but without the distinguishing rings on the lower half of the body. The body was constructed of drawn sheet steel in two parts. These two sheet metal cups are welded together in the centre forming a barrel shaped body which is then coated with a baked enamel finish. A steel bushing, threaded on the inside, is welded to the top of the grenade, providing a means of attaching the detonator thimble to the body. The thimble seals the top of the grenade and prevents the filling coming into contact with air, the detonator, or the fuze. It is threaded on the outside to fit the bushing and has internal threading to fit the Mk. III fuze mechanism. The Mk. III fuze mechanism consists of the Mk. II bouchon assembly, 2 inch fuse, and No. 8 detonator. The body of this grenade is painted grey, or has a grey paint mark on it, and was smooth to quickly differentiate it from the Gas grenade.

Bob Leiendecker Collection

These grenades were packed 24 to a case. The fuze mechanisms were issued separately and were

packed 384 mechanisms in a wooden box.

By the end of the war some 150,600 of these grenades had been delivered overseas to the American Expeditionary Force. The companies involved in the production of Phosphorous grenades included: Metropolitan Engineering Co. Brooklyn N.Y., Evinrude Motor Co. Milwaukee, and Zenite Metal Co. Indianapolis.

Gas Hand Grenade, KJ, Mk. II
TYPE- Gas
WEIGHT- 22 oz.
HEIGHT- 3 13/16 in.
DIAMETER- 2 1/8 in.
FILLING- Stannic Chloride
IGNITER- Mk. II
DELAY- 5 sec.

Rex Gollogly Collection

The body of the Gas Grenade is made of two drawn sheet steel cups, welded together in the middle to be gas tight and coated with a baked enamel finish. A threaded steel bushing, welded to the top of the body, provides a means of attaching the detonator thimble to the body. The detonator thimble screws into the bushing sealing in the gas and acts as a socket for the Mk. II fuze mechanism. The lower portion of the body has two corrugations to differentiate the gas grenade from the phosphorous grenade. The specifications for the grenade body were initially developed prior to the type of filling being known. At that point, the body welds were required to pass an air pressure test of 200 pounds. About 50 percent of the bodies failed this inspection. After June 1918 the gas had been decided upon (Stannic Chloride) and the pressure requirement was reduced to 50 pounds. At this lower point the welding of the bodies readily passed the inspection.

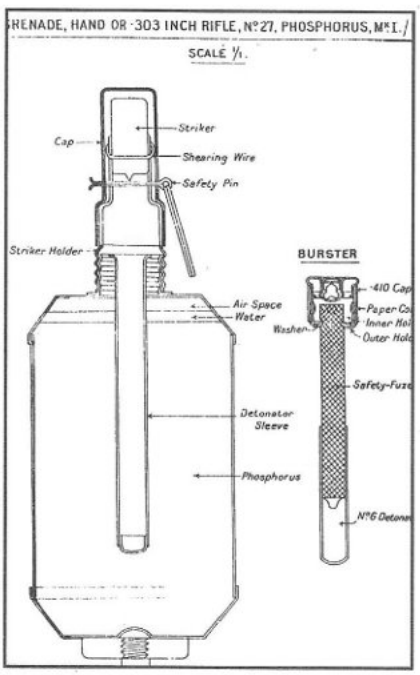
The body of a live grenade was painted gray with a marking of "KJ" to designate the filling. Stannic Chloride was intensely irritating to the eyes and respiratory passages, it could cause lacrimation and violent coughing rendering the target personnel ineffective. Operation is as for the Defensive Grenade, Mk. II. The No. 8 fulminate detonator alone is sufficient to burst the body and scatter the contents in all directions.

These grenades are packed unfuzed, 24 to a case which is then sealed and marked. The detonator thimble is closed by a wooden plug. Fuze mechanisms are packed in separate boxes containing 384 assemblies.

The design of the gas grenade was completed in January 1918, by the end of the war 249,239 of these grenades had been sent overseas.

Companies involved in the production of the grenades include: Maxim Silencer Co., Hartford Conn.; Bassic Co., Bridgeport, Conn.; Evinrude Motor Co., Milwaukee; John W. Brown Manufacturing Co., Columbus Ohio; and Zenite Metal Co., Indianapolis.

Combination Hand and Rifle Grenade, WP, Mk. II
TYPE- Smoke, Rifle
WEIGHT- 1.2 lb.
LENGTH- 3.75 in.
DIAMETER- 2.25 in.
FILLING- .90 lb. White Phosphorous
FUZE DELAY- 5 seconds



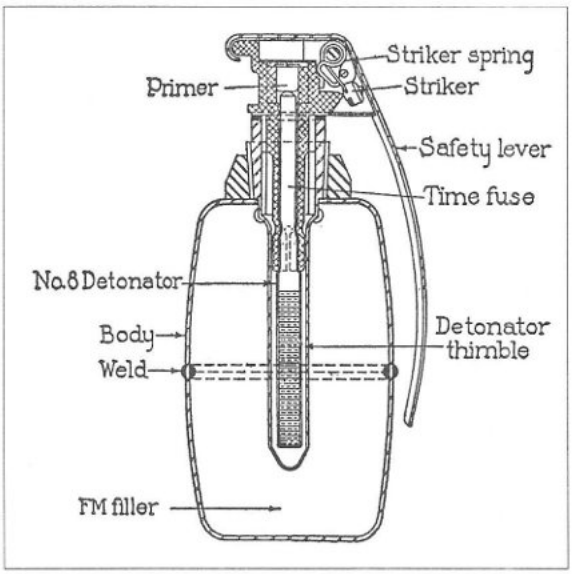
This is an American copy of the British No.27 and as such is identical to the British model. In fact these grenades may never have been produced by the United States but were simply supplied by the British and re-designated. The body is cylindrical and capped on both ends by dished tinned plate stampings. A steel base plate is soldered to the base cap and is tapped to receive a 15-inch steel rod. A striker chamber is soldered to the top cap and is externally threaded to hold the firing mechanism. The firing mechanism is covered by a metal cover, held in place by a retaining pin and ring.

When used as a hand grenade the rod is not fitted, the retaining pin is pulled and the cover removed from the firing mechanism. The firing mechanism is then struck on any convenient hard object to initiate the delay fuse. The grenade must be thrown immediately after initiating the fuze.

When used as a rifle grenade, the rod is screwed into the base. The rod is inserted into the muzzle of the rifle, pushed down as far as it will go, and the protective cover removed from the firing mechanism. The grenade can then be fired using a special blank cartridge supplied for the purpose. When the grenade is fired, the setback caused by firing causes the firing mechanism to function and ignite the delay fuze. The maximum range obtained by firing from a rifle is 230 yards.

Smoke Hand Grenade, FM, Mk. II
TYPE- Smoke
WEIGHT- 17 oz.
IGNITER- M6
FILLING- Titanium tetrachloride

This grenade uses the same style body as the "Grenade, Phosphorous, Mk. II". The body is constructed of two sheet steel cups welded in the middle. A detonator thimble is fitted through a hole in the top providing a cavity for the detonator and sealing the liquid filling into the grenade. A bushing attached to the top is internally threaded to accept an adapter. The M6 fuze mechanism then screws into the adapter. The safety lever on the fuze is longer than that used on the earlier grenade. The body is painted gray with a yellow band andthe letters "FM" in yellow.



The filling of "FM" (titanium tetrachloride) will spread over an area of about 10 yards when the grenade is detonated. The filling produces a cloud of non-toxic smoke when exposed to air. It is noted in the Field Manual that this filling is suitable only for training purposes.

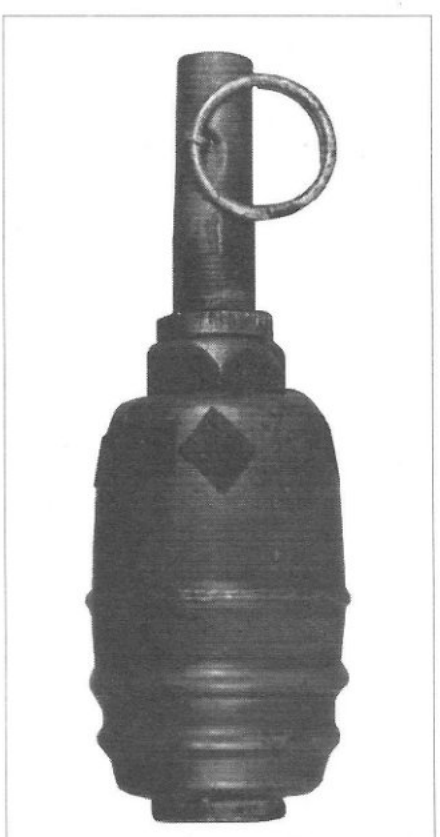
The body of the grenade is painted gray with one yellow band. The fuze mechanism is unpainted.

These grenades were issued unfuzed and it was necessary to prepare them for use. The method of fuzing is as follows;

- Unscrew and remove the wooden shipping plug.
- Examine the cavity to ensure it is clear.
- Insert the fuze mechanism.
- Holding the fuze stationary, screw the grenade body onto the fuze.
- Tighten the fuze using the wrench provided.

Grenade, Rifle, Lachrymatory, CN, Mk. II
TYPE- Gas
WEIGHT- 9.8 oz.
IGNITER- M8
FILLING- Chloracetophenone

This rifle grenade uses the same basic body as the "Lachrymatory Hand Grenade Mk. V". The body is constructed of two sheet steel cups, welded in the middle. Two horizontal corrugations on the lower cup aid in the identification of the grenade. Holes evenly spaced around the top half of the grenade serve as gas escape ports and are covered by a small piece of tape over each hole. A steel bushing is welded to the top of the grenade and a steel disc is welded to the bottom. A steel launching rod screws into the base disc. The CN filler is contained in the lower 2/3 of the body and is covered by a meal powder starting mixture. The M-8 fuze mechanism screws directly into the top bushing. The end of the time fuze is covered by a small portion of the Meal powder starting mixture to ensure the ignition of the grenade.



The fuze mechanism is of the percussion type. It consists of a base containing a delay element with the end covered by meal powder

starting mixture. The upper portion of the fuze consists of a tube containing a primer, striker, shear wire, and safety pin. The entire mechanism is then covered by a thin sheet metal cap with the safety pin fitting through the cap, sides of the tube, and striker.

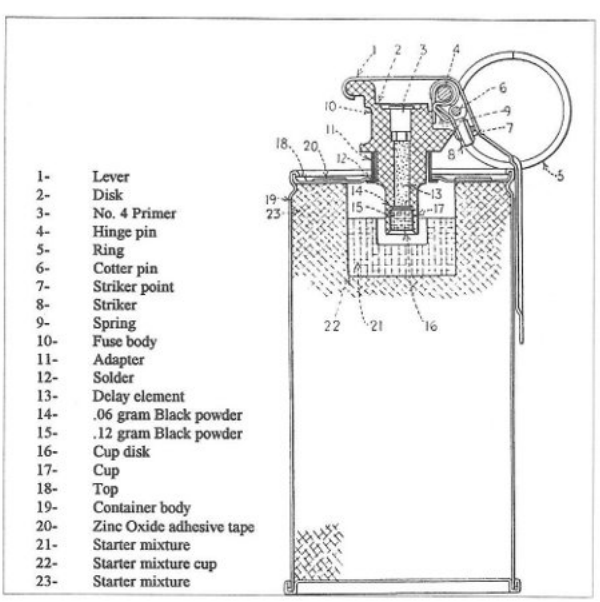
The body is painted grey with one green band and other markings in green. Markings include "CN" above the band, "GAS" below the band and the lot number below that. The fuze is unpainted. The grenade may also be found with the body painted grey with two 1/4" red bands around the middle and other markings in red. The other markings include "CN" above the bands and the lot number near the base of the grenade.

The grenade was packed in wooden boxes containing 24 fuzed grenades. When the safety pin is pulled the striker is held in position by the shear wire. On firing, the setback caused by the shock of firing causes the striker to break the shear wire, move down the tube and hit the primer. The primer then ignites the delay fuze which burns down to the starting mixture and ignites it.

It appears that this grenade could be used by hand if necessary. By removing the launching rod, pulling the safety pin and striking the head of the grenade on a hard object, the striker would be driven into the primer starting the delay element. The grenade would then be thrown immediately.

Smoke Candle, HC Mk. II
TYPE- Smoke
WEIGHT- 1.75 lb.
DIAMETER- 2 5/16 in.
HEIGHT- 5.75 in.

This smoke candle consists of a cylindrical tin body 4.5 inches high with a fuse mechanism attached to the top. A zinc cup 1.125 inches diameter and 0.75 inch deep, containing the starting mixture, was placed in a depression left in the top of the smoke compound filling. The body top, with four emission holes and a brass adapter attached, fit on top of the zinc cup and was crimped onto the main body. The fuze mechanism screws into the brass adapter. The emission holes are each covered by a small square of adhesive tape.



The smoke mixture consists of hexachlorethane, powdered zinc, ammonium perchlorate, and ammonium chloride. The starting mixture is composed of potassium nitrate, antimony trisulfide, and dexrtrine.

The body is painted grey with a yellow band and markings. Markings include "HC SMOKE" above the band and "US", a manufacturers mark, and the lot number below the band. All markings are in half-inch letters.

When the safety pin is pulled and the lever released, the striker rotates forward and strikes the percussion cap. The percussion cap ignites the delay element which in turn ignites the starting mixture. The starting mixture burns through the zinc cup and starts a chemical reaction with the smoke mixture which generates a considerable amount of

heat and forms zinc chloride. The zinc chloride escapes through the emission holes as a dense white cloud. The candle burns for between 2.5 and 3.25 minutes at full volume.

This smoke candle was later renamed as "Smoke Grenade, HC M8", the forerunner of the Grenade, Hand, Smoke, HC, AN-M8. As such, the grenades are very similar in construction.

Grenade, Hand, Offensive, Mk. III
TYPE- Offensive
WEIGHT- 15 oz.
HEIGHT- 3.75 in.
DIAMETER- 1.875 in.
FILLING- 4 oz. Trojan Grenade Powder
IGNITER- Mk.II. III Fuze
FUZE DELAY- 5 sec.

Rick Larson Collection

This offensive grenade was designed in early 1918 for use in the First World War. It was an American innovation to use bodies made of paper The body is formed of spirally wound, laminated paper to a 7-ply thickness of 3/32 inch. It is made in two parts, an inner shell and an outer shell. The inner shell is impregnated and coated with paraffin. After assembly the entire body is treated with another waterproofing compound.

The top cap of the grenade is a lead-antimony die casting. The upper portion is formed into a cone with a threaded hole in the centre to fit the Mk.III fuze assembly. The cap portion is smooth on the top but has an annular groove cast into the bottom. The body is assembled to the top cap by inserting the open end in the annular recess and crimping it on, forming a waterproof joint. The Mk.III fuze mechanism is composed of the Mk.II bouchon assembly with a 2 inch fuse and no. 8 detonator.

Early manufactured grenades will be found painted grey or with a mark of grey paint on the body, indicating a "live" grenade. Grenades of later manufacture may be found painted yellow with markings in black.

The grenade was supplied packed in cases of 48 with the case marked and sealed. The detonator well is closed by a wooden plug in storage. Fuze mechanisms are supplied separately in wooden boxes with 384 assemblies.

By the end of the World War One 5,359,321 had been manufactured, and of these 173,136 had been sent overseas to the American Expeditionary Force. Companies involved with the production of Offensive grenades include; Acme Die Castings Co., National Lead Casting Co., Doehler Die Castings Co., and the chief contractor, Single Service Package Corporation.

Grenade, Hand, Offensive, Mk. IIIA1

There appears to be two distinct variations of the MK.II. IIIA1 grenade. The first, described in FM23-30 dated June 15, 1942 and FM23-30 dated February 14, 1944 is as follows;

WEIGHT- 11 oz.
FILLING- TNT
IGNITER- M6A2
FUZE DELAY- 4-5 sec.

This is described as having a body of laminated cartridge paper and having a die cast top threaded to accept the M6A2 Fuze mechanism. It appears that this version is an adaptation of the original Mk.III body, being modified to take the new detonating fuze mechanism. In this case the only metal portions of the grenade are the fuze mechanism and the die-cast top.

The body is painted yellow with the Type (offensive), Model (Mk.IIIA1), and Lot number, all marked in black on the main portion of the body. The fuze mechanism will be marked on top of the safety lever with the fuze model, lot and date.

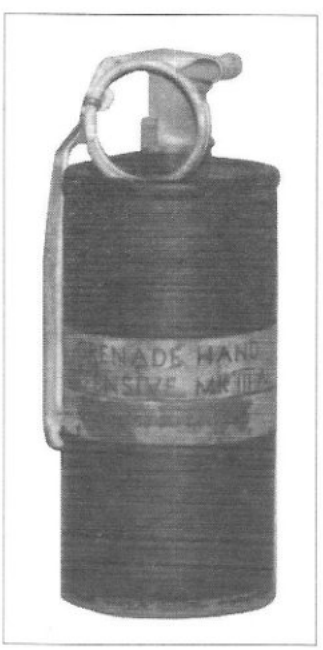
These grenades were packed unfuzed with 25 bodies per carton with 8 cartons per wooden box.

The second variation is listed in documents from "Office, Chief of Ordnance" dated 1 March, 1944, FM23-30 dated April 1949 and TM 9-1985 dated 22 October, 1943;

WEIGHT_ 14 oz.
FILLING- 6.83 oz. TNT
IGNITER- M6A2 or M6A3
Fuze Delay- 4-5 sec.

The body of this version is made of laminated cartridge paper or pressed fibre with sheet metal ends crimped onto the main cylinder. The cylinder is made in two parts, the top portion fitting over the bottom. The joint is covered by a label. An adaptor, threaded to receive the fuze mechanism, is attached to the top sheet metal end of the grenade. It may be fitted with either the M6A2 or M6A3 fuze mechanism.

The body is painted black with a yellow label running around the centre. Markings giving the Type, Model, Lot number and date of manufacture are marked on the yellow band. The fuze mechanism will be marked on the safety lever giving the model, lot number, manufacturer's mark and date. The second version of the grenade appears much later than the first (1943 or 1944), the most likely reason



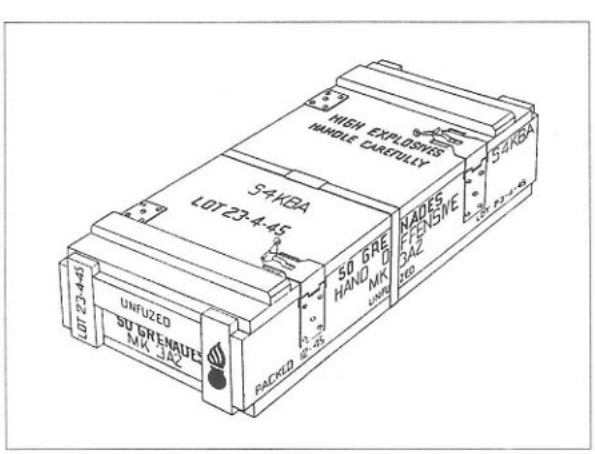
Rick Larson Collection

for the change in body style is ease of manufacture. Stamping sheet metal ends being easier and less expensive than die casting. No matter which type, the grenades were intended primarily to be used as a small demolition charge. The best effects were obtained by placing the grenade in position when attempting to destroy equipment rather than by throwing it. The other use is as an offensive grenade. The grenade produced little fragmentation and was reasonably safe to use in the open, outside its practical range. The grenade was very effective against enemy troops in enclosed spaces such as rooms or bunkers.

Grenade, Hand, Offensive, Mk. 3A2
TYPE- Offensive
WEIGHT- 15.6 oz.
LENGTH- 5.35 in.
DIAMETER- 2 1/8 in.
IGNITER- M6A3, M206A1 or M206A2
FUSE DELAY- 4-5 sec.
FILLING- 8 oz. TNT

This is an improvement on the Mk.IIIA1. It eliminates the sheet metal ends and contains more explosive. The body, in the shape of a cylinder, is made totally of asphalt impregnated fibre. The ends are slightly rounded where they meet the sides of the body. The body is made of two sections, the top section fitting over a portion of the bottom. The joint is then covered by a label. A hole in the centre of the top is threaded to fit the fuze mechanism. The hole is sealed by a waterproof paper disc in storage. The igniter mechanism is of the detonating type, either the M6A3, M206A1 or M206A2. A safety clip may or may not be fitted.

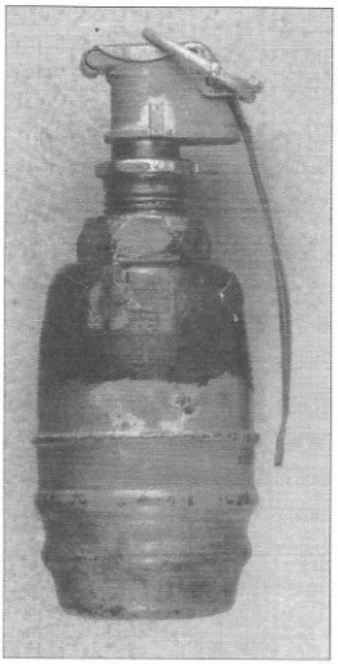
The body is black with a yellow label around the centre. Markings on the band are in black and give the type, model, lot number, and date of manufacture. Later manufacture of the grenade eliminated the yellow label, instead marking the grenade in yellow directly on the body. The fuze mechanism is olive drab with black markings on top of the safety lever.



These grenades may be issued fuzed, with or without safety clips, or unfuzed. The grenade bodies are packed 50 per wooden box with no inner packing containers.

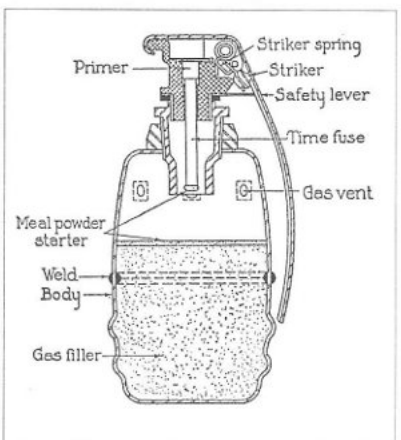
The grenade is designed to produce casualties during close combat using concussion. The effective casualty radius in the open is 2 metres, in confined areas such as bunkers and buildings, the effects would be increased. This grenade is also used as a small demolition charge by placing the grenade in place rather than throwing it. These grenades cannot be fitted with an adapter for launching from a rifle.

Lachrymatory Hand Grenade, CN, Mk. V
TYPE- Gas
WEIGHT- 8.65 oz.
IGNITER- M7
FILLING- CN



Rex Gollogly Collection

This grenade uses a modified body of the "Gas Grenade, Mk. II". The body is constructed of two sheet steel cups, welded in the middle. The upper half has a fuze adapter welded to the top. An M7 fuze mechanism screws into the fuze adapter. Holes evenly spaced around the top half of the grenade serve as gas escape ports with a small piece of tape covering each hole providing a moisture seal. Two horizontal corrugations on the lower cup identify the grenade as a gas grenade. The CN filler is contained in the lower 2/3 of the body and is covered by a meal powder starting mixture. The end of the time fuse is also covered by a small portion of the meal powder starting mixture to ensure the ignition of the grenade. The safety lever on this fuze mechanism is longer than those used on earlier gas grenades.



The body of the grenade is painted gray with one green band and other markings in green. This grenade was supplied fuzed ready for use.

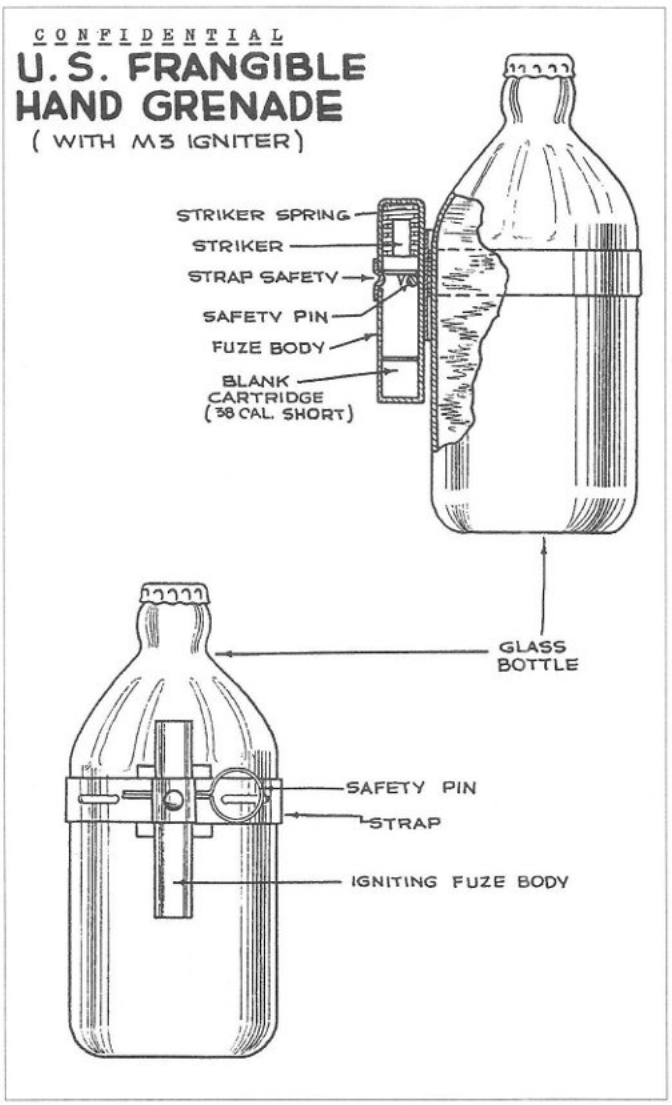
Frangible Grenade, M1
TYPE- Frangible
WEIGHT- Varies with filling
FILLING- Varies
MARKING- None

This grenade is multi-purpose and may be filled with a number of different fillings. Depending on the filler it may or may not require an igniter. Three different types of igniter were used with the grenade.

The main portion of the grenade is a common one pint glass bottle, initially with a screw cap but later changed to a crown cap. No bursting charge is required as the contents are dispersed when the body is broken on impact with the target. The normal radius of burst is 5 yards.

Igniter M1- This igniter consists of a cylindrical sheet plastic jacket containing a special ignition powder. It is used with an M1 grenade filled with a mixture of gasoline and alcohol. When the grenade breaks against an object, broken glass cuts the jacket allowing the filler to make contact with the special ignition powder. The resulting chemical reaction spontaneously ignites the filling. This igniter is simply taped to the side of the bottle.

Igniter M2- This igniter is a paper cartridge filled with an incendiary powder and is actuated by a pull wire fuze lighter. It is used with gasoline-filled M1 grenades. After ignition the grenade is thrown and when it breaks against the target, the contents are ignited. This igniter is attached to the body by two strips of tape running completely around the grenade.



Igniter M3- This igniter consists of a body, striker and spring, blank cartridge, and strap. It is used with gasoline- and napalm-filled M1 grenades. It is attached to the body of the grenade with a "Timmerman Strap". When the grenade is thrown and broken the strap and strap safety are released allowing the striker to fall and fire the blank cartridge which then ignites the filling. A safety pin must be removed prior to throwing.

Fillings

AC- Hydrocyanic Acid. No igniter required. Weight of grenade is 14 ounces. This filling is a powerful nerve agent which, in weak concentrations, will cause dizziness, headache, an unpleasant taste in the mouth, and a rush of blood to the head. In strong concentrations, death is instantaneous.

ALCOHOL-GASOLINE- Uses Igniter M1. The weight of this grenade is 25 ounces. The igniter activates when the body breaks, allowing the filler to come into contact with the chemicals in the igniter.

AW- Mixture of phosphorous and a rubber-gasoline solution. No igniter is required. The weight of the grenade is 40 ounces. This filling will spontaneously ignite upon exposure to air.

CNS- Chloracetophenone solution. No igniter required. Weight of grenade is 35 ounces. This filling has lachrymatory effects similar to CN.

FS- Sulfur trioxide-chlorsulfonic acid mixture. No igniter required. The weight of the grenade is 42 ounces. This is a corrosive liquid which reacts with the atmosphere producing casualties and creating an effective smoke screen.

GA- Gasoline. Uses Igniter M2. Weight of this grenade is 24 ounces. Upon breaking the contents of the bottle are scattered and ignited by the igniter.

IM- Thickened Gasoline. Uses Igniter M3. Weight of the grenade is 24 ounces. This filling will adhere to smooth surfaces.

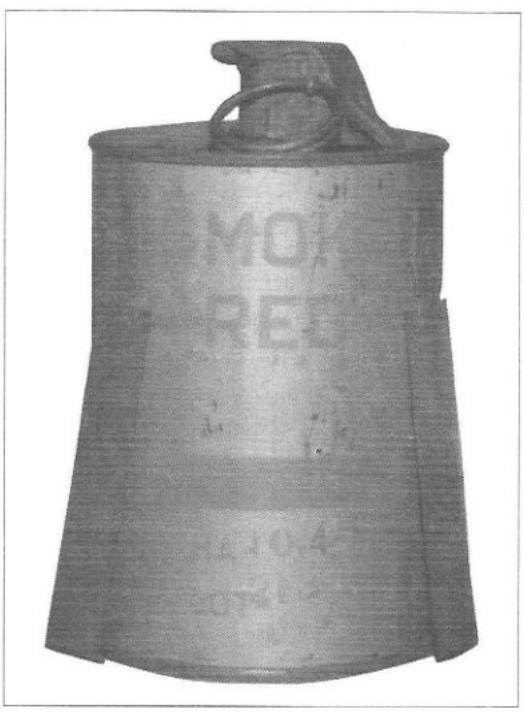
NP- A mixture of Napalm and Gasoline. Uses Igniter M3. Weight of the grenade is 15 ounces. The filling will adhere to smooth surfaces.

M1- Chlorvinyldichlorarsine (Lewisite). No igniter required. Weight of grenade is 42 ounces. This filling is a liquid which gradually changes to a gas. Extremely vesicant, either the gas or liquid will burn the skin or lungs severely. Casualties normally develop several hours after exposure.

Grenade, Smoke, Red, AN-M3
TYPE- Smoke, signalling
WEIGHT- 28 oz.
DIAMETER- 3 in.
HEIGHT- 5.5 in.
IGNITER- Modified M200A1 or M200A2
FUZE DELAY- 2 sec.
FILLING- Red smoke compound

This smoke grenade is slightly larger than normal. The standard grenade body is assembled in a cylindrical outer container with eight emission holes in the top. Three sheet metal wings are attached to the outside of the body near the top. The fuze mechanism is modified by having the safety lever cut off near the top, allowing the fuze to fit the larger body.

When used, the wings should be bent upwards to serve as additional bases and prevent the grenade sinking below the surface when placed in mud, swampy ground, or snow. The main purpose of the grenade is signalling, therefore the grenade should be placed in position rather than thrown. For use, the modified safety lever must be held down with the hand holding the grenade, the safety pin removed with the other hand, and the grenade placed in position. When in position the safety lever can be released and, after a delay of 2 seconds, smoke will begin to emit through the holes. When ignited, the grenade emits smoke, which is exceptionally visible against a snow background, for approximately 2 minutes 20 seconds. This grenade is supplied in red only.

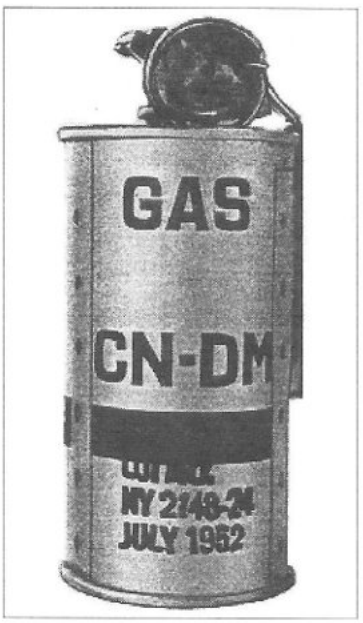


The body is painted blue/grey and has yellow markings. Markings include a yellow band, "SMOKE RED" above the band, lot number, filler's initials, and date of filling, in yellow below the band.

This grenade was normally used as a distress signal by the Army, Navy, and Air Force.

Grenade, Hand, Gas, Irritant, M6
TYPE- Gas, Irritant
WEIGHT- 17 oz.
FILLING- 10.5 oz. CN-DM
IGNITER- M200A1 or M201A1
DELAY- 1.2-2 sec.
GAS DURATION- 25-40 seconds

This grenade is made of tin plate in a cylindrical form. The top is of a heavier gauge metal than the sides or bottom in order to support the fuze adapter. All joints on the body are crimped, soldered, or both. There are six emission ports around the top and three rows of six vertically on the side of the body. Each of the emission ports is covered by a small square of zinc oxide adhesive tape. A fuze adapter is crimped to the top is internally threaded to accept the fuze mechanism. The fuze mechanism may be either the M200A1 or the M201A1, both of which have a delay of 2 seconds.



The filling is a mixture of CN (Chloracetophenone) and DM (Diphenylaminechlorarsine) having both the lachrymatory effects of CN and the irritant effects of DM. The gas compound is mixed with a burning compound consisting of finely granulated smokeless powder and a binder of magnesium oxide. The gas cloud created is white to yellow in colour and has a pungent fruit-like odour. The smell of smokeless powder is also apparent. After functioning the grenade emits gas within 3 seconds, the gas continues for approximately 25 to 40 seconds.

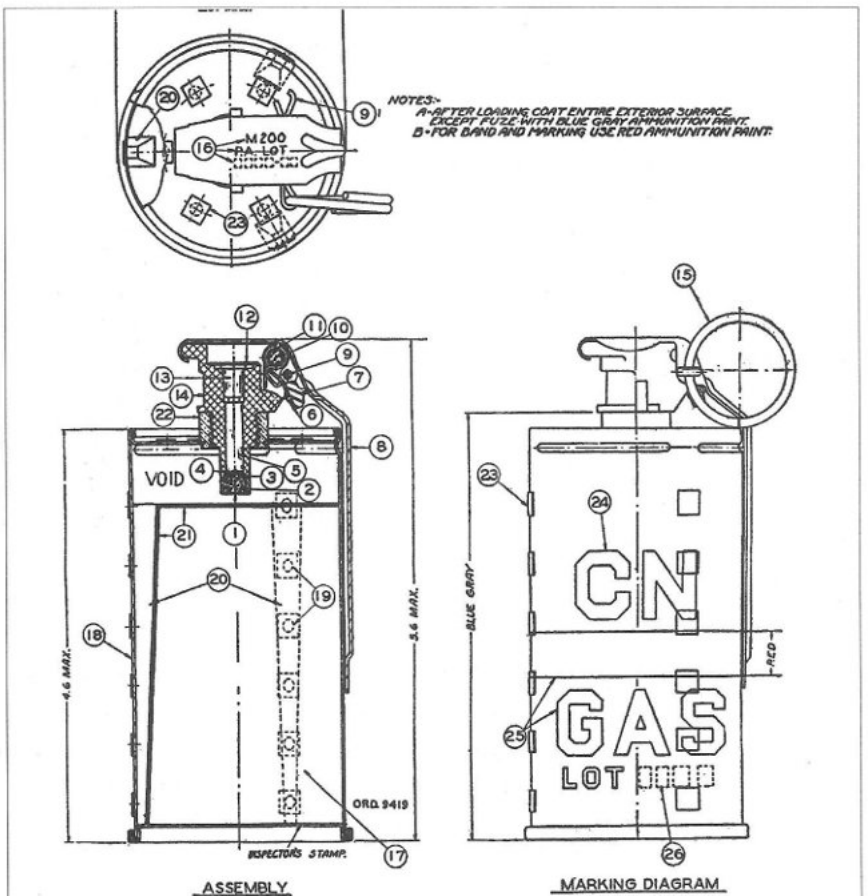


FIGURE 7.—Grenade, hand, gas, irritant, CN, M7, with hand grenade igniting fuze, M200.

1. Outer disk (gilding metal).
2. Ignition charge (black powder).
3. Washer (brass).
4. Relay charge (black powder).
5. Delay charge (black powder).
6. Striker.
7. Striker point.
8. Lever.
9. Cotter pin.
10. Hinge pin.
11. Spring.
12. Disk (tin foil).
13. Primer assembly, Mk. V.
14. Fuze body.
15. Ring.
16. Model of fuze, manufacturer's initials, and fuze lot number stamped on lever.
17. Charge (CN mixture).
18. Chemical grenade body.
19. Vents.
20. Tapered slots formed in CN charge.
21. Charge (starting mixture).
22. Adapter.
23. Seal (adhesive tape).
24. Symbol of chemical filler.
25. A ½-inch band and "GAS" (stenciled in red) indicate that the grenade produces irritant gas.
26. Ammunition lot number.

The filling is pressed into the body under a pressure of 4700 pounds per square inch and has tapered grooves under each row of vents formed into it. A starting mixture of black meal powder and a liquid binder is poured on top of the filling during the filling process and allowed to flow into the tapered grooves. After drying it ensures a rapid and uniform ignition of the filling and burns off the tape covering the emission holes at the same time.

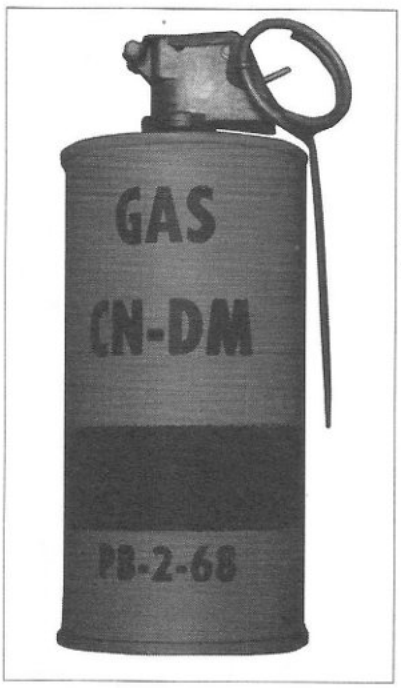
The body is painted blue/grey with one red half-inch band with other markings in red. Markings include "GAS CN-DM", lot number, loaders initials, and the date of filling. The fuze is marked with the model, manufacturers initials and lot number. Very early production grenades may be found with a green band and markings in green. This method of marking was obsolete prior to 1936.

The grenade was normally packed with 25 grenades in a wooden packing box. With the attachment of an M2A1 adapter, this grenade may be launched from a rifle to a distance of about 120 metres.

Grenade, Hand, Gas, Irritant, M6A1
TYPE- Gas, Irritant
WEIGHT- 20 oz.
IGNITER- M201A1
FILLER- 9.5 oz. CN-DM

The body of this grenade is made of sheet steel. It differs from the M6 chiefly in the number and placement of emission ports. On the M6A1 there are four emission holes around the top and one on the bottom. A brass bushing mounted on the top is threaded to accept the fuze mechanism. The body is painted blue/grey with red markings and one red band. Markings on the body will have "GAS CN-DM", the lot number, and the date of filling.
The filling is the same as used in the M6 but the M6A1 contains about 1 ounce less. Gas will be emitted for a period of 20-60 seconds.

If fitted with the M2A1 adapter, this grenade may be launched up to 120 metres from a rifle.



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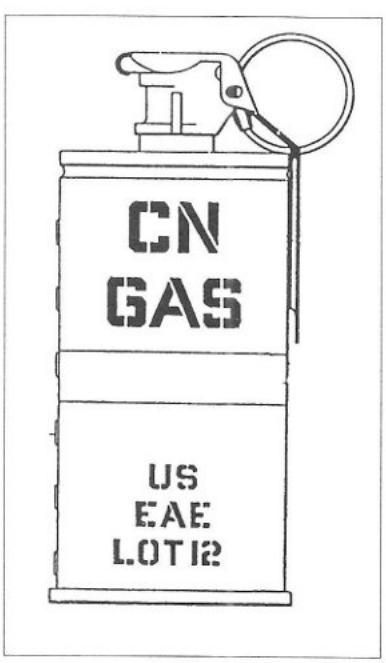
Grenade, Hand, Gas, Tear, M7
TYPE- Gas
WEIGHT- 17 oz.
LENGTH- 5.7 in.
DIAMETER- 2.5 in.
IGNITER- M200A1 or M201A1
FUSE DELAY- 0.7-2 sec
GAS DURATION- 20-60 sec
FILLING- 10.25 oz. CN Pyrotechnic composition

This grenade utilizes the same body as the M6 grenade, made of sheet steel in a cylindrical shape. There are six emission ports around the top and two rows of nine or three rows of six vertically on the side of the body. Each of the emission ports is covered by a small square of adhesive tape. A brass bushing attached to the top is internally threaded to accept the fuze mechanism. The fuze mechanism may be either the M200A1 or the M201A1, both of which have a delay of 2 seconds. The M200A1 fuze mechanism will be found on early production grenades while the M201A1 will be found on the later production.



The filling consists of 28% chloracetophenone 69.4% E.C. smokeless powder, and 2.6% magnesium oxide. The filling is pressed into the body under a pressure of 4700 pounds per square inch and has tapered grooves under each row of vents formed into it.

A starting mixture of black meal powder, along with a liquid binder is poured on top of the filling during the filling process and allowed to flow into the tapered grooves.

After drying it ensures a rapid and uniform ignition of the filling and

burns off the tape covering the emission holes at the same time.

The CN gas produced is irritating to the upper respiratory tract and in high concentration, to the skin causing a burning and itching sensation. The cloud produced ranges from blue-gray to colourless and has a fruit-like pungent odour. The gas begins about one second after activation and continues for 25 to 35 seconds.

The body of the grenade is painted blue/grey with one half-inch red band and markings in red. Markings include "CN GAS", the lot number, manufacturers initials, and date of filling.

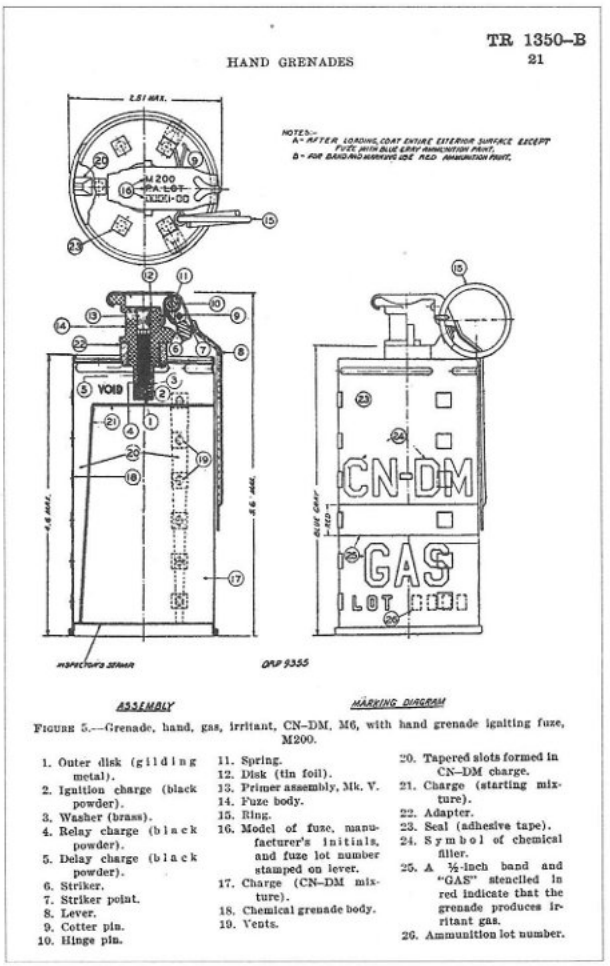


FIGURE 5.—Grenade, hand, gas, irritant, CN–DM, M6, with hand grenade igniting fuze, M200.

1. Outer disk (gilding metal).
2. Ignition charge (black powder).
3. Washer (brass).
4. Relay charge (black powder).
5. Delay charge (black powder).
6. Striker.
7. Striker point.
8. Lever.
9. Cotter pin.
10. Hinge pin.
11. Spring.
12. Disk (tin foil).
13. Primer assembly, Mk. V.
14. Fuze body.
15. Ring.
16. Model of fuze, manufacturer's initials, and fuze lot number stamped on lever.
17. Charge (CN–DM mixture).
18. Chemical grenade body.
19. Vents.
20. Tapered slots formed in CN–DM charge.
21. Charge (starting mixture).
22. Adapter.
23. Seal (adhesive tape).
24. Symbol of chemical filler.
25. A ½-inch band and "GAS" stenciled in red indicate that the grenade produces irritant gas.
26. Ammunition lot number.

Fuze markings will be found on the top of the safety lever. Very early production grenades will be found with a green band and markings in green.

The grenades were normally packed 25 to a wooden box.

Grenade, Hand, Gas, Tear, M7A1

TYPE- Gas
WEIGHT- 18.5 oz.
LENGTH- 5.7 in.
DIAMETER- 2.5 in.
FILLING- 12.5 oz. CN Pyrotechnic composition
IGNITER- M201A1
FUSE DELAY- 0.7-2 sec
GAS DURATION- 20-60 seconds

This grenade utilizes the same body as the M6A1. The body of this grenade is made of 28-gauge rolled sheet steel. It differs from the M7 chiefly in the number and placement of emission ports. On the M7A1 there are four emission ports around the top and one on the bottom. The ports are closed by a square of adhesive tape over each. A brass bushing mounted on the top is threaded to accept the fuze mechanism.

The grenade is painted blue/grey with a red band and markings in red. Markings on the body will include "GAS CN", the lot number, and date of filling.

The filling of CN (Chloracetophenone) produces a severe burning sensation in the eyes causing almost continuous tearing, impaired vision, or temporary blindness. No permanent damage is caused by exposure to CN gas.

Grenade, Hand, Riot, CS, M7A2
TYPE- Gas
WEIGHT- 15.5 oz
LENGTH- 5.7 in.
DIAMETER- 2.5 in.
FILLING- 3.5 oz. CS
IGNITER- M201A1
FUSE DELAY- 0.7-2 sec

The main body is cylindrical in shape, made of sheet metal, and has a brass fuze adapter crimped into the top.
There are four emission holes evenly spaced around the top and one large one in the bottom. Each hole is covered by a small square of tape. An M201A1 fuze, which allows a delay of up to 2 seconds, screws into the fuze adapter.

The filling is pressed into the body leaving a large hole down the centre. The entire surface of the filling is coated with a starter mixture. The filling consists of 5.5 ounces of burning mixture mixed with 3.05 ounces of powdered CS in gelatin capsules.

The body is painted grey with one red band and markings in red. Markings include model, filling, and lot number. The fuze is marked on the olive drab safety lever with the model, lot number, and manufacturers initials.

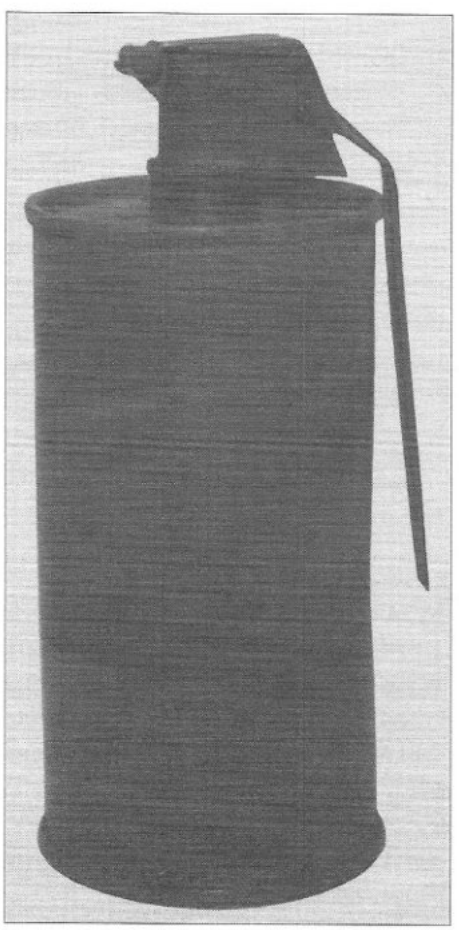
The grenade will emit CS gas for approximately 20-60 seconds. The CS gas is similar in effect to CN but is more persistent and creates a more severe reaction.

Grenade, Hand, Riot, CS, M7A3
TYPE- Gas
WEIGHT- 15.5 oz.
LENGTH- 5.7 in.
DIAMETER- 2.5 in.
FILLING- 4.5 oz. CS
IGNITER- M201A1
FUSE DELAY- 0.7-2 sec.

The body is cylindrical in shape, made of sheet metal, and has a brass fuze adapter crimped into the top. There are four emission holes in the top and one large one in the bottom. Each hole is covered by a small square of tape which is blown or burned off when the grenade functions. An M201A1 fuze, which gives a delay of up to two seconds, screws into the fuze adapter.

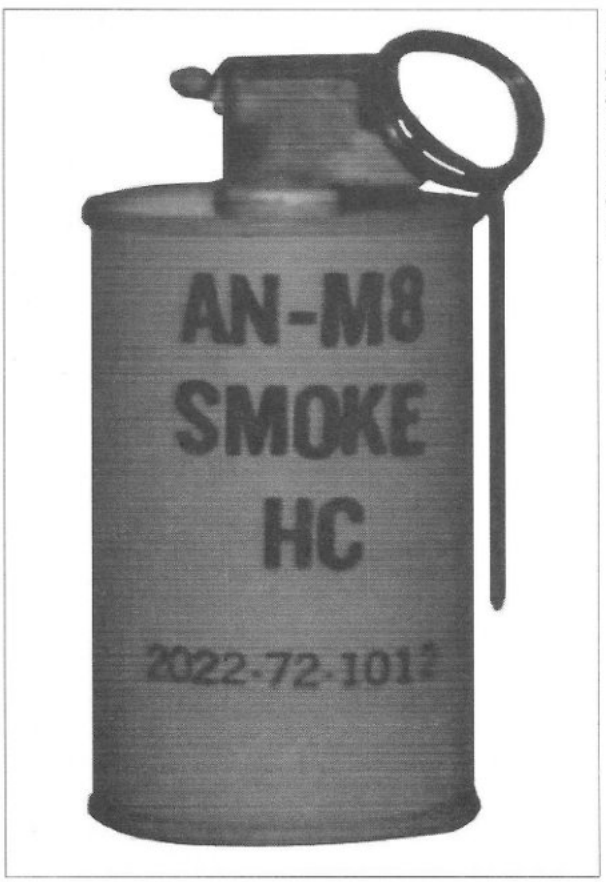
The filling is pressed into the body leaving a hole down the centre. The surface of the filling is coated with a starter mixture. The filling consists of 7.35 ounces of burning mixture mixed with 4.5 ounces of pelletized CS.

The body is painted grey with one red band and markings in red. Markings include model, filling, and lot number. The fuze is marked on the olive drab safety lever with the model, lot number, and manufacturers initials.



Grenade, Hand, Smoke, HC, AN-M8
TYPE- Smoke
WEIGHT- 24 oz.
LENGTH- 5.7 ins.
DIAMETER- 2.5 ins
FILLING- 19 oz. HC (Hexachloroethane)
IGNITER- M200A1, M200A2, or M201A1
FUSE DELAY- 0.7-2 sec

This grenade is a development of the "Smoke Candle, Mk. II". The body is basically the same size and shape as other American chemical grenades. It is made of 28 gauge sheet steel and shaped like a tin can. Four emission holes are evenly spaced around the top outer edge and covered with small squares of tape. The fuze mechanism screws into a bushing mounted in the centre of the top.



Rick Larson Collection

Initially the M200A1 fuze mechanism was used but was changed to the M201 or M201A1 in the late 40's or early 50's. These fuze mechanisms give a delay of 2 seconds.

A filling of 19 ounces of type C, HC smoke mixture is contained within the body. The grenade produces dense clouds of white smoke for 105-150 seconds. The smoke produced clings to the ground better than the smoke produced by a white phosphorous grenade. Primary uses are signalling and screening the movement of small units for a short duration. If the filling is exposed to moisture, a chemical reaction can occur causing the filling to spontaneously ignite.

This grenade can be projected about 120 metres from a rifle when attached to an M2A1 grenade adapter.

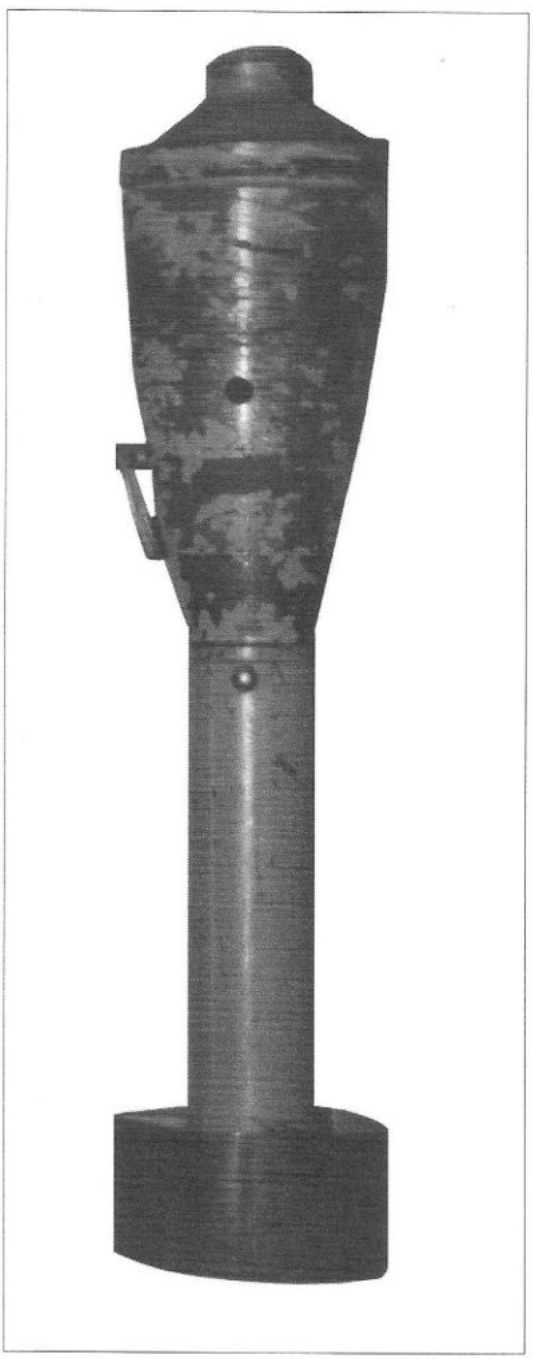
The bodies of early production grenades are painted blue-grey with one yellow band and "HC SMOKE" in yellow. Later production grenades are painted light green with a white top, markings are in black. The safety lever is grey or olive drab with black markings.

The grenades are packed in individual fibre containers with 16 containers in an outer packing box.

The prefix "AN" before the designation of the grenade indicates joint acceptance by the Army and Navy.

Grenade, Rifle, Anti-tank, M9
TYPE- Rifle, Antitank
WEIGHT- 1.5 lbs.
LENGTH- 9.25 in.

This was the first American antitank grenade and was adopted on 30 December 1940. The head was shaped like an acorn with the igniter in the nose of the grenade. The safety pin is located in the lower portion of the body and is held in place by a strip of tape. The positioning of the igniter caused many of the grenades fired to be duds because of the grenade striking the target at such an angle that the igniter was left untouched. To ensure functioning, the grenade was required to strike a hard resistant body within 20 degrees of normal. Having the igniter in the nose also reduced the effect of the shaped charge. With the safety pin removed, the grenade would detonate if dropped vertically onto a surface of average hardness from a height of two feet.



Rick Larson Collection

Average penetration of homogeneous steel plate was 1.75 inches. The grenade is painted yellow with black markings giving the model and lot number.

The grenades were packed along with a launching cartridge in individual fibre containers with 10 grenades in a wooden case.

This grenade did not remain in service, being quickly replaced by the M9A1. It is listed in the Field Manual of 1942 as is the M9A1 but does not appear in any manuals after that. It appears likely that this grenade did not see active service but was replaced by the M9A1 prior to American troops engaging enemy forces.

Grenade, Rifle, Anti-tank, M9A1

TYPE- Rifle, Antitank
WEIGHT- 19.68 oz.
LENGTH- Total- 11.24 in.
Body- 5.98 in.
Stabilizer- 5.26 in.
DIAMETER- 2.25 in
IGNITER- Impact
FILLING- 4 oz. Pentolite

The body of the M9A1 grenade is made of steel. The nose is covered by a sheet steel wind screen which also provides the proper stand off for the shaped charge. The stabilizer assembly has fins which are enclosed by a solid ring, the fins are spot welded to the tail boom. This version uses a base detonating impact igniter mechanism located in the upper portion of the stabilizer tube. This system eliminated the problems which occurred with the M9. This model has a safety clip located in the upper portion of the stabilizer tube assembly. The grenade was used throughout the American involvement in the Second World War and was in limited service up to the Korean War. The impact fuze is more sensitive than that used in the M9 and may detonate on contact with soft earth. Penetration of homogeneous steel plate is approximately 2.5 inches.

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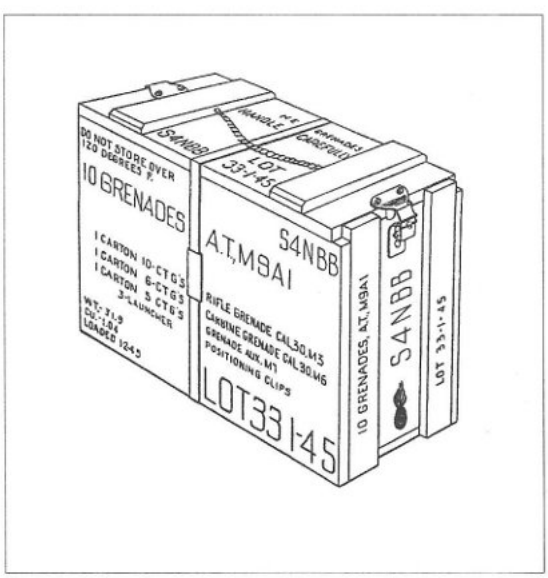


Initially painted yellow with black markings, by 1943 the colour had been changed to olive drab with yellow markings. Markings include the model and lot number of the grenade.

The grenade is packed in individual fibre containers (M81) which are then packed in a wooden box along with 11 launching cartridges. It may also be packed in individual containers with ten grenades in a wooden box along with ten M3 launching cartridges, six M6 launching cartridges, and five M7 auxiliary launching cartridges.

The grenade had a range of 184 yards when fired from the M1 Carbine or 287 yards when fired from the M1 Rifle.

Grenade, Rifle, Anti-tank, M10

TYPE- Antitank

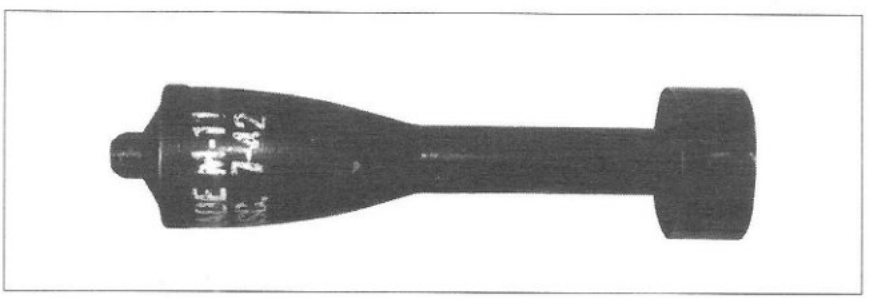
This was an antitank grenade developed along with the M9, it proved to be too heavy for projection from a rifle. Attempts were made to launch it from the .50 Machine gun but this proved to be impractical. An unconfirmed report states that the remaining M10 grenades were used as the basis of the rocket for the original 2.36 inch rocket launcher. The grenade is mentioned in TM9-1900 dated July 3,1942. It is described as having the same general configuration as the M9, AT, Rifle Grenade. It was to be projected by a special projector.

Grenade, Rifle, Practice, M11 series
TYPE- Rifle, Practice

All models of the M11 series are painted black with markings in white. Markings normally include the designation, lot number, manufacturers initials, and date of manufacture. The grenades were packed in individual fibre containers with 50 grenades per wooden box. Spare parts and launching cartridges were supplied separately.

Grenade, Rifle, Practice, M11
LENGTH- 9.25 in.
DIAMETER- 2 in.

This model is the practice version of the M9 antitank grenade. It consists of two parts, a head assembly and a stabilizer assembly. The head is acorn shaped, made of cast iron, and threaded at the base to receive the stabilizer assembly. The stabilizer assembly is made of sheet steel with a threaded adapter rivetted on the top end and the fins spot welded to the bottom.

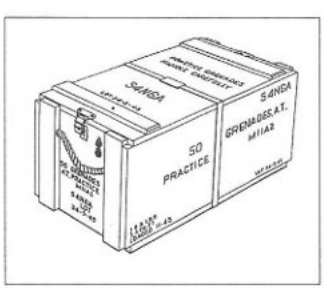


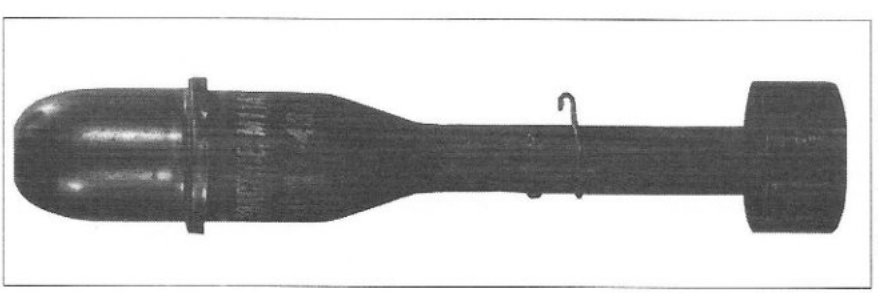
Grenade, Rifle, Practice, M11A1
LENGTH- 11 in.
DIAMETER- 2.125 in.

This model is the practice version of the M9A1 anti-tank grenade. It consists of two parts, a head assembly and a fin assembly. The entire fin assembly had to be replaced if any part of it became damaged.

Grenade, Rifle, Practice, M11A2
LENGTH- 11.25 in.
DIAMETER- 2 1/8 in.

This model is designed so that any part may be replaced if damaged. It consists of four parts: a sheet metal ogive, cast iron body, stabilizer tube, and fins. The stabilizer tube is rivetted to the threaded adapter. A safety pin fits through the stabilizer assembly and clips over the tube. It is the practice version of the M9A1 Anti-tank Grenade.

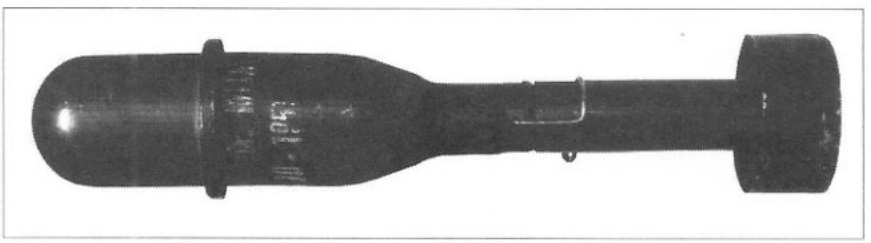




Chris Arnold Collection

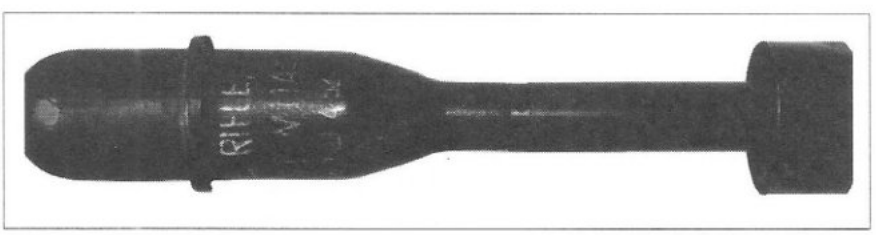
Grenade, Rifle, Practice, M11A3
LENGTH- 11.25 in.
DIAMETER- 2 1/8 in.

This grenade consists of four parts similar to the M11A2. There are minor changes to the construction. The stabilizer tube is attached to the adapter by a crimp and is spot welded in place. A safety pin fits through the adapter and clips against the stabilizer tube. This models the practice version of the M9A1Anti-tank Grenade.



Grenade, Rifle, Practice, M11A4
LENGTH- 11 1/8 in
DIAMETER- 2 1/8 in.

This model again consists of four parts. The stabilizer tube is attached to the adapter differently, and does not show a crimping seam. It is the practice version of the M9A1 Anti-tank grenade but continued in service for firing practice long after the M9A1 was withdrawn from service.

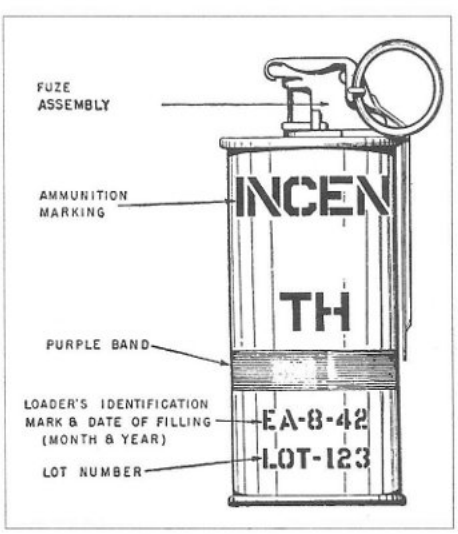


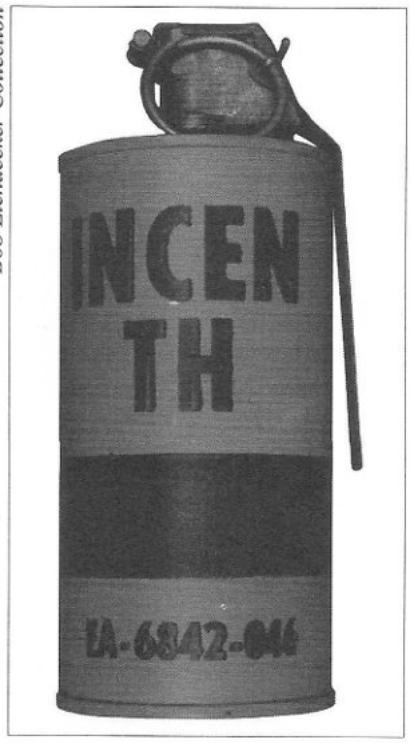
Grenade, Rifle, Practice, M13
TYPE- Rifle, Practice

This model, only vaguely listed in TM9-1900, July 3,1942, is given as the practice version of the M10 Anti-tank rifle grenade. As the M10 was never taken into service so it is assumed that this grenade was never taken into service either.

Grenade, Hand, Incendiary AN-M14
TYPE- Incendiary
WEIGHT- 32 oz.
LENGTH- 5.7 in.
DIAMETER- 2.5 in.
FILLING- 26.5 oz. TH3 Thermate
IGNITER- M200A1, M201A1
FUSE DELAY- 2-3 sec.

The tin-plate body is virtually the same as the AN-M8 without the emission holes. A bushing centred in the top of the grenade is internally threaded to accept the igniter mechanism. The M200A1 igniter mechanism, giving a delay of 2 seconds, was used throughout the Second World War. During the 1950's the fuze mechanism was changed to the M201 or M201A1 with the same delay. The grenade was designed to burn for a





Bob Liendecker Collection

minimum time of 24 seconds to a maximum of 36 seconds. A filling of 26.5 ounces of TH3 (Thermate) is contained in the body.

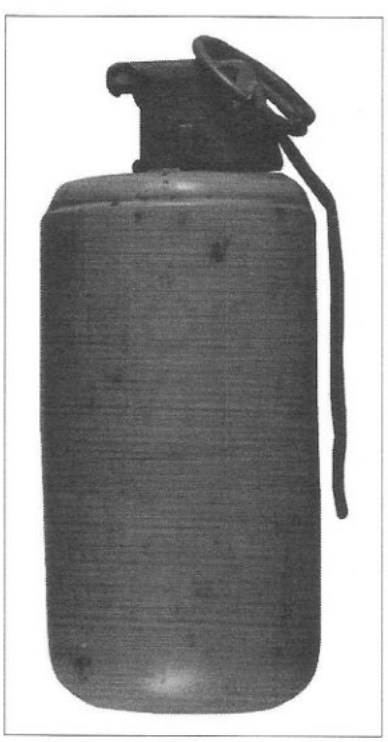
The Thermate burns at approximately 4000 degrees for 30 to 45 seconds. As it burns, a portion is converted to molten iron which will fuse any metallic objects it comes into contact with. The grenade can burn through a half-inch of homogeneous armour plate. Thermate also produces its own oxygen while burning and can be used under water with little loss of effect. Thermate is an improved version of Thermite, the older incendiary agent used in American grenades. It appears this grenade was initially filled with Thermite (TH). It is unclear when the filling was changed to the improved Thermate (TH3).

The primary use of this type of grenade is to destroy equipment. It will destroy mortar tubes, artillery breech mechanisms, engine blocks, and just about any other metallic object. This grenade should not be thrown at a target but should be placed in position to obtain the best effect. Each grenade is issued with a metal strap which can be slipped on to prevent the grenade rolling away after placement.

The body of the grenade is painted blue/grey with a purple band and "TH INCENDIARY" in purple. These markings were used until the "Standard Colour Coding System" was brought into effect. Thereafter the grenade was painted light red with black markings. The safety lever will be grey or olive drab with markings in black.

The grenades are packed in individual fibre containers within an outer packing box holding 16 containers. Positioning clips are issued with each grenade. The clips are made of spring steel and prevent the grenade from rolling out of position and can be used to nail the grenade into position.

The prefix "AN" prior to the designation of the grenade indicates the joint acceptance of the grenade by both the army and navy.



Rex Gallogly Collection

Grenade, Hand, Smoke, WP, M15
TYPE- Smoke
WEIGHT- 32 oz.
LENGTH- 5 ins.
DIAMETER- 2.38 ins.
FILLING- 15 oz. White Phosphorous
IGNITER- M6A2, M6A3, M206A1, or M206A2
FUSE DELAY- 4-5 sec.

The body of this grenade is made of 18 gauge sheet steel, cylindrical in shape with slightly rounded edges. The body is manufactured in two pieces, a cylinder for the lower portion and a cap which has the fuze adapter and detonator well mounted on it. The top is brazed onto the bottom section providing an airtight seal.

The grenade is painted blue/grey with a yellow band around the

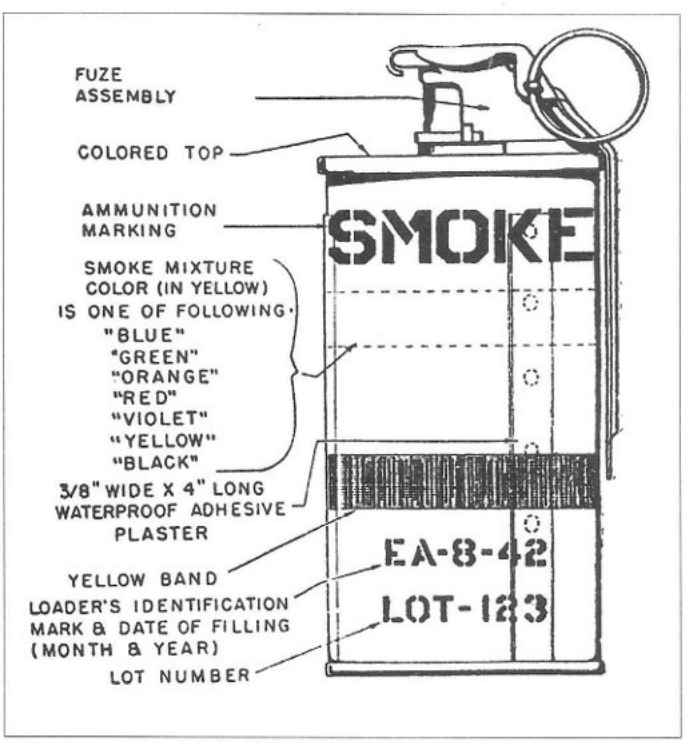
centre and other markings in yellow. The markings include "WP SMOKE", lot number, loaders initials, and date of filling.

This grenade uses a detonating type fuze mechanism, initially the M6A2 and later the M6A3, M206A1 or M206A2. The detonator bursts the body and scatters the contents out to a distance of 25 metres. The white phosphorous ignites upon contact with the air, causing an almost instantaneous smoke screen and seriously injuring any personnel in the area of the blast. The smoke produced tends to rise quickly because the white phosphorous burns with an intense heat. When used as a screening agent it is best employed on damp days with little wind. The grenade was also used as an anti-personnel weapon, particularly in the Pacific Theatre of Operations during the Second World War. It was also used as an incendiary grenade and a signalling grenade.

Grenade, Hand, Smoke, Coloured, M16
TYPE- Coloured smoke
WEIGHT- 17 oz.
DIAMETER- 2.5 in.
HEIGHT- 5.7 in.
IGNITER- M200A1
FUZE DELAY- 2 sec.

This grenade was similar in appearance to most American chemical grenades. The body is cylindrical, made of tin-plate, and has two sheet steel ends attached to the main body cylinder with rolled seams. There are six emission holes evenly spaced around the top and three rows of six holes in the side of the body. A brass bushing, attached through a hole in the top, is threaded to fit an M200A1 fuze mechanism.

The filling is a mixture of sulfur, potassium chlorate, sodium bicarbonate, and dye in one of seven colours. The grenade was produced in red, blue, green, orange, black, violet, and yellow. The M16 will emit smoke for 110 to 150 seconds.



The grenade is painted blue-grey with a yellow band, and markings in yellow. The top of the grenade and an additional band around the grenade are painted in the colour of smoke produced.

The trial version of this grenade was designated T2. This consists of the body of the MK2A1 attached to a stabilizer tube assembly by means of an adapter. It is initiated by an impact igniter located at the top of the stabilizer tube. A safety pin passes through the stabilizer tube, preventing the plunger from hitting the detonator. When fired, the setback caused by firing ensures the striker does not impact with the primer. Upon impact the striker is driven forward, compressing a creep spring, and impacts with the primer. The primer initiates the detonator and a tetryl booster. The igniter will function on impact which is sufficient to sharply retard its flight. It may not function if the grenade strikes a grazing blow or on impact with water. This grenade was discontinued and production stopped by 1 May 1944 in favour of the combination adapter and grenade.

Rex Gallogly Collection

A project to change the filling from E.C. Blankfire powder to 2 ounces of TNT was initiated. This also involved modifying the fuze. The booster was replaced with 13.5 grain PETN blasting cap which extended into the fuze body. These grenades were designated M17E1. The grenade reached the testing stage but the project was shelved in favour of the combination grenade and adapter.

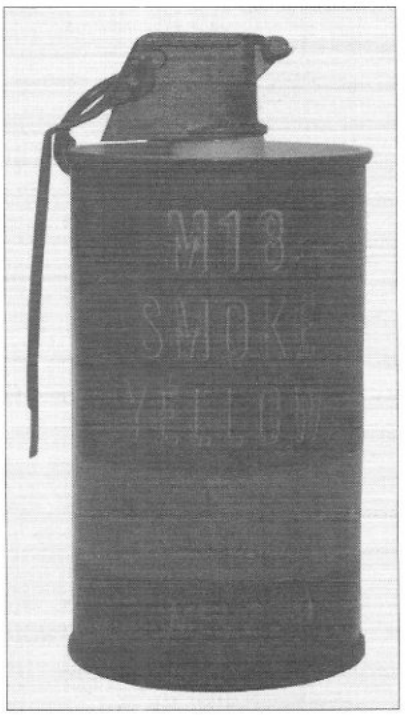
Grenade, Rifle, Fragmentation, M17
TYPE- Rifle, Fragmentation
WEIGHT- 25.3 oz.
LENGTH- 9.775 in.
DIAMETER- 2.25 in.
FILLING- 0.77 oz. EC Blankfire Powder
IGNITER- Impact

The grenade is painted olive drab with yellow markings. The grenades are packed in individual fibre containers (M112). The fibre shipping container is sealed with yellow tape and is marked in black with the type, model, manufacturer's initials, and lot number. There are ten containers, a carton of 11 launching cartridges and three positioning clips packed in a wooden packing box. It may also have been packed ten containers per box with ten M3 cartridges, six M6 cartridges, and five M7 auxiliary cartridges.

This grenade is launched from a spigot launcher, either M1, M2, M7, or M8 using a grenade launching cartridge. Range when fired from the M1 Carbine is 136 yards and 200 yards when fired from the M1 Rifle.

Grenade, Hand, Smoke, Coloured, M18
TYPE- Smoke
WEIGHT- 19 oz.
LENGTH- 5.75 in.
DIAMETER- 2.5 in.
FILLING- 11.5 oz. Smoke composition
IGNITER- M200A1, M201, or M201A1
FUSE DELAY- 0.7-2 sec.

The body of this grenade is the same basic body as is used in most American chemical grenades. It is shaped like a tin can, made of sheet steel, and has a brass bushing attached to the top end. The fuze mechanism screws into the bushing. Safety clips are not used with these grenades. There appear to be several variations of the grenade with differing numbers and placement of the emission holes. One version has four holes located on top and one large one in the bottom. Another is noted to have six emission holes in the top and one in the bottom, and yet another has only one large hole in the bottom.



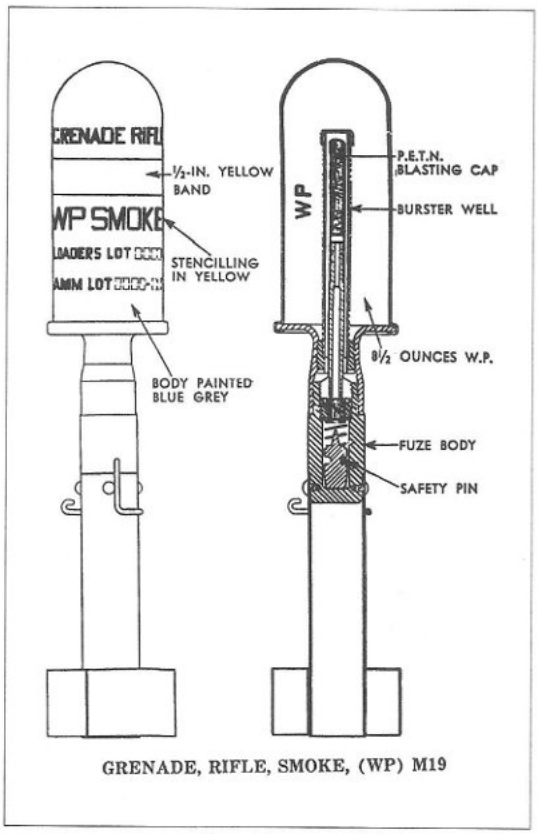
The grenade was initially produced in the same seven colours as the M16, this was later reduced to four colours, red, green, violet, and yellow. The grenade is used for signalling or to produce a smoke screen. The fumes from the burning grenade can be toxic in an enclosed area. This grenade can be launched from a rifle using an M2A1 adapter.

The grenade was initially painted blue/gray with a yellow band and markings in yellow. The top and an additional band are painted in the colour of smoke produced. The newer standard colour coding system indicates that it is painted light green with black markings and the top painted the colour of smoke produced. Most, however, are found painted olive drab with grey or yellow markings and the top painted in the colour of smoke produced. These latter date from the Viet Nam era.

Grenade, Rifle, WP, M19/M19A1
TYPE- Smoke
WEIGHT- 24 oz.
LENGTH- 11.31 in.
DIAMETER- 2.0 in.
FILLING- 8.5 oz. White Phosphorous
IGNITER- Impact
DANGER RADIUS- 10 metres
MAXIMUM RANGE- 195 metres

This grenade was first introduced to service near the end of the Second World War as the "T5 Smoke Rifle Grenade". With some modification the trial grenade (T5) became the M19 WP grenade.

The grenade consists of three main parts, a body, an integral fuze, and a stabilizer tube with fins. The head is made of sheet steel, cylindrical, with a round nose. The white phosphorous filling is contained within the head. The base is made of a heavier cast material, it forms the base of the head and stem containing the fuze mechanism. The fuze consists of a striker, spring, primer, flash tube, and detonator. The safety pin fits through the stem engaging a groove in the striker. The detonator is powerful enough to burst the body and scatter the contents over an area of 10 metres. The stabilizer tube is attached to the stem by rivets or small screws and has an internal diameter of 22mm. A set of fins is attached to the bottom end of the tube. The fins of the M19A1 may be of two



GRENADE, RIFLE, SMOKE, (WP) M19

types, solid ring or cutout ring. The safety pin may also be of two types, a wire pin which fits through the stabilizer tube and fuze and clips against the tube or a safety clip type which clips together around the tube holding a pin in to prevent the functioning of the fuze.

The grenade operates on impact. After firing, and upon impact, the striker overcomes the resistance of the spring and hits the primer. The primer fires flashing up through the flash tube into the detonator. The detonator explodes, bursting the body and scattering the filling over an area of about 10 metres. As the white phosphorous filling comes into contact with the air, it spontaneously ignites producing a dense cloud of white smoke. The filling burns at ap-proximately 5000 degrees for 60 seconds. In addition to producing a smoke screen the grenade is useful as an anti-personnel or incendiary device

The grenade was initially painted grey with yellow markings, after the standardized colour coding was instituted the grenade was painted light green with a yellow band and red markings.

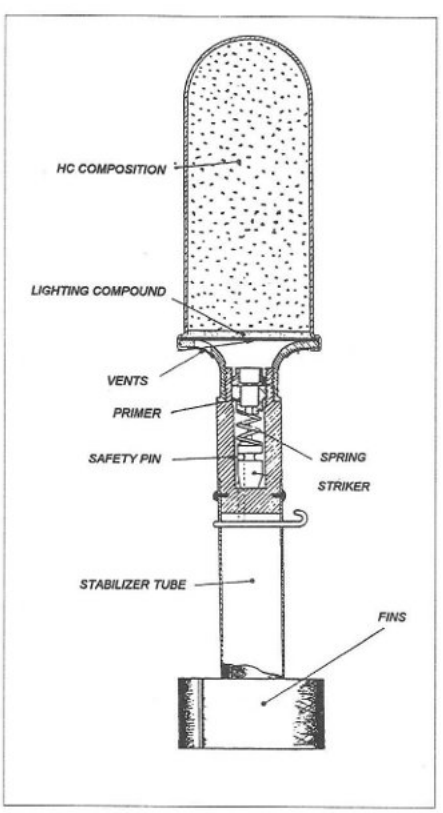
These grenades were packed in individual fibre containers within a wooden box holding 10 grenades. Packed in each box, with the grenades, were 10 M3 launching cartridges, six M6 launching cartridges, five M7 auxiliary launching cartridges, and three positioning clips.

The grenade will travel approximately 195 yards when projected from a .30 cal. or 7.62 mm service rifle equipped with a launcher. By 1969 this grenade was being phased out of service, its roles being filled by the M34 WP grenade and other munitions.

Grenade, Rifle, Smoke, HC, M20
TYPE- Smoke
WEIGHT- 24 oz.
LENGTH- 273 mm
DIAMETER- 54 mm
IGNITER- Impact
FILLING- 10.1 oz. HC smoke compound

Introduction of this grenade was near the end of the Second World War. It was initially designated as the T6E1.

This grenade is constructed of three main components, the head, fuze, and stabilizer. The head is constructed of sheet steel, is cylindrical, and has a rounded nose. The base of the head is of a heavier cast material and tapered down to a stem



which contains the fuze mechanism. Five vents are evenly spaced around the outside edge of the base. The head is filled with an HC smoke composition with a lighting compound covering the base. The fuze mechanism is of the direct action impact type with a striker held back by a creep spring. A wire safety pin fits through the stem and engages a groove in the striker, preventing its movement. The safety pin is locked in place by clipping it down over the stabilizer tube. The stabilizer tube with fins attached is rivetted onto the stem.

If the filling is exposed to moisture, a chemical reaction can occur causing the spontaneous ignition of the filling. The grenade was painted grey with a yellow band and markings in yellow.

These grenades were packed in individual fibre containers within a wooden box holding ten grenades. Packed in each box, with the grenades, were ten M3 launching cartridges, six M6 launching cartridges, five M7 auxiliary launching cartridges, and three positioning clips.

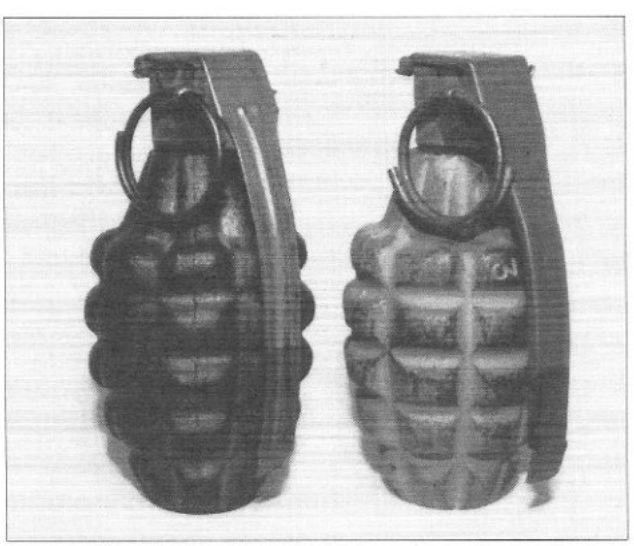
When launched, the safety pin having been removed, the force of impact causes the striker to overcome the resistance of the spring, allowing it to strike the primer. The primer ignites, flashes onto the lighting compound igniting it. The lighting compound then ignites the HC smoke compound. Smoke is emitted through the vents for approximately one minute.

This grenade did not remain in service for long. It was developed during the Second World War and appears to have been out of service by 1949.

Grenade, Hand, Practice, M21

TYPE- Practice
HEIGHT- 4.5 inches
DIAMETER- 2.25 inches
WEIGHT- 21 oz.
IGNITER- M10A3, M205A1, or M205A2
FUZE DELAY- 4-5 sec.
FILLING- 21 grains Black Powder

This is the practice version of the Mk. 2A1. It is very similar to the Mk. 2 Practice grenade but has some minor differences. The body is cast iron and has an un-threaded hole in the base. The casting of this grenade is normally better than the Mk. 2A1, on the Mk. 2A1 the pro-trusions made by grooving the body are normally flat on the top surface. On the M21 the protrusions are more rounded and prominent. It may be found with either the M10A2, M10A3,



Grenade, Hand, Practice, M21. The model on the left displays the earlier type of safety lever while the one on the right has the later style. The same fuze mechanism was used with both.

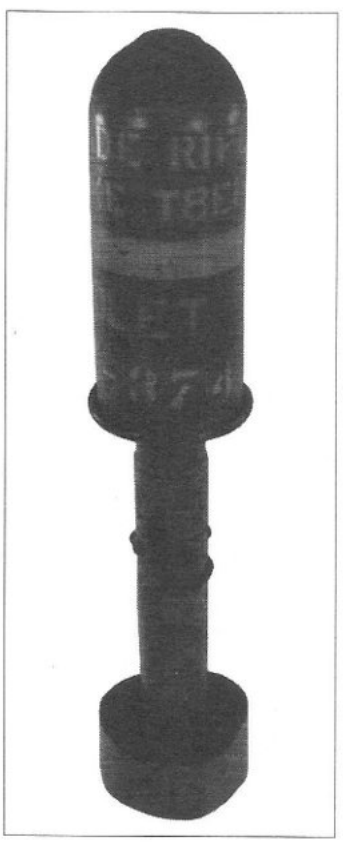
M205A1, or M205A2 igniting fuze mechanisms. The body may be reused as long as it remains undamaged. Reuse involves replacing the fuze mechanism, black powder charge, and closing plug.

The body of the grenade is unpainted or painted light blue, the fuze mechanism is green with the safety lever painted blue with a red or brown lower end and black markings.

This grenade was developed to replace the Mk. 2 Practice grenade when the Mk. 2 bodies were used up. With the development of the Mk. 2A1 grenade, production of Mk. 2 bodies ended. The Mk. 2 practice grenade used the same body as the Mk. 2 Fragmentation grenade but without the filling plug, the filling hole providing the necessary gas escape. The Mk2A1 body does not have a filling hole, therefore a new body was required, the new grenade became the M21.

Grenade, Rifle, Smoke, Coloured, M22/M22A2
TYPE- Smoke
WEIGHT- 20.2 oz.
LENGTH- 10.72 in.
DIAMETER- 1.8 in.
IGNITER- Impact
FILLING- 6.5 oz.
MAXIMUM RANGE- 200 meters

Initially introduced as the T8E1 in the latter portion of the Second World War this grenade evolved into the M22 series. The grenade has three main parts, the head,, fuze, and stabilizer tube. The head is made of sheet steel, is cylindrical with a rounded nose. The base is made of a heavier cast material with the sheet steel head crimped on. A closing plug is fitted at the nose of the grenade and five emission holes are evenly spaced around the base. The fuze is a mechanical impact igniting type and is contained within the stem on the base. A safety pin fits through the stem and fuze preventing its operation until removed. The stabilizer tube is then crimped onto the stem. The grenade may be found with either the solid fins or perforated fins on later production models. The grenade was first produced in four colours, red, green, violet, or yellow. Later production eliminated the violet retaining the other three. The primary use is for signalling, however, it can provide an effective localized smoke screen if necessary. Upon ignition the grenade will produce smoke for approximately one minute.



Norman Bonney Collection

The grenade was initially painted grey with yellow markings and the base painted in the colour of smoke produced. After adoption of the standard colour code system, the grenade was painted light green with black markings and the base painted in the colour of smoke produced.

These grenades were packed in individual fibre containers within a wooden box holding 10 grenades. Packed in each box, with the grenades,

were ten M3 launching cartridges, six M6 launching cartridges, five M7 auxiliary launching cartridges, and three positioning clips. This grenade will travel over 200 metres when fired off a .30 cal. or 7.62 mm service rifle.

The M22 and M22A2 differ only in minor features such as the fin assembly and safety clip. The M22 has the stabilizer tube attached to the stem by small rivets, the M22A2 by spot welding. The fin assembly on the M22 has a solid ring and on the M22A2 it has an open ring.

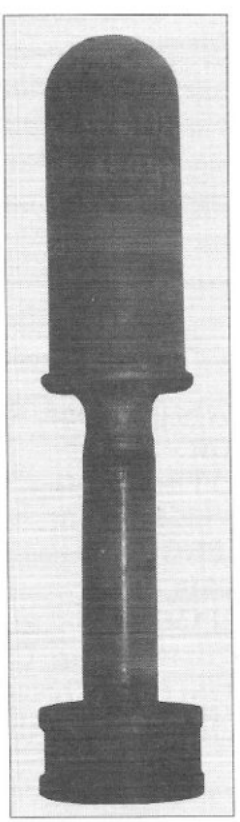
Grenade, Rifle, Smoke Streamer, Coloured, M23/M23A1
TYPE- Smoke, streamer
WEIGHT- 1.16 lb.
LENGTH- 9.89 in.
DIAMETER- 1.8 in.
MAXIMUM RANGE- 200 metres
FILLING- 0.4 lb.

This grenade was initially introduced in a trial version as the T12. The M23 grenade is constructed in the same manner as the M22 grenade with the exception of an air intake hole in the nose and the lack of a fuze mechanism. The air intake is covered by tape prior to use. There is no safety pin or device with this grenade as no fuze mechanism is required. This grenade will also be found with both types of fin attached to the stabilizer tube.

The filling of the grenade is made up of a mixture of baking soda, potassium perchlorate, sugar, and dye. The grenade is supplied in four colours, red, green, violet and yellow.

The grenade was initially painted grey with yellow markings and the base painted in the colour of smoke. This was changed when the standard colour coding system was adopted to light green with black markings and the base painted in the colour of smoke.

Before firing the tape covering the nose of the grenade must be removed. Upon firing the flash from the launching cartridge ignites the igniting charge which in turn ignites the starter mixture. The starter then ignites the smoke compound. Air entering the hole in the nose forces the smoke through the emission holes in the base, producing a streamer of smoke starting approximately 15 metres from the muzzle and continuing throughout the flight of the grenade. The smoke stream will last approximately 12 seconds.

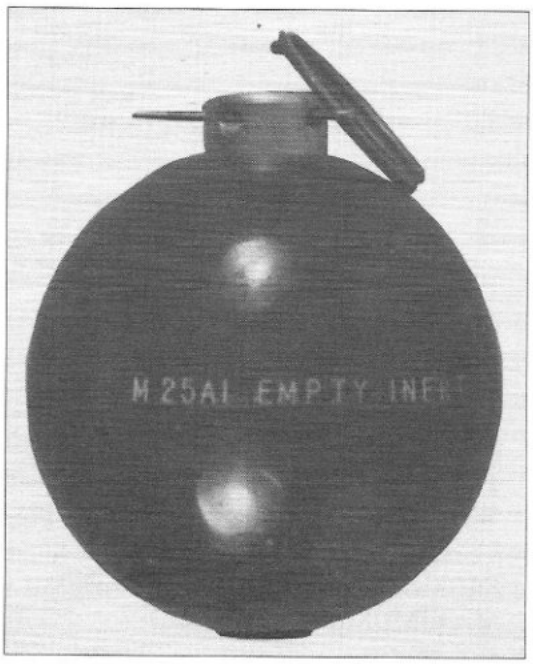


This grenade is used for signalling only as it does not produce enough smoke to create a screen. The grenade could be quite a hazard to the man firing it if his position is under enemy observation. The streamer of smoke would draw a line directly to his position which could then be brought under fire.

The grenades are packed in individual containers inside an outer packing box containing 10 grenades.

This grenade was adopted for use near the end of the Second World war and by 1969 was being phased out of service.

Grenade, Hand, Riot, CN1, ABC- M25A1
TYPE- Riot, Gas
WEIGHT- 7.5 oz.
LENGTH- including fuze- 3.4 in.
DIAMETER- 2.93 in.
FILLING- 3.2 oz. CN1
IGNITER- C12 Integral



Rex Gallogly Collection

The grenade body is constructed of two plastic hemispheres cemented together. The two halves form a burster well and slider housing in the centre of the body. A filling hole is located in the lower half, slightly offside to the centre and is closed by a threaded plug. The fuze is integral with the body. A safety pin fits through the arming sleeve and slider assembly locking the arming sleeve to the body and holding the arming pin in a horizontal position.

When the safety pin is removed the arming sleeve must be held against the body with the thumb or a finger. When thrown, the arming sleeve is free to separate from the body and frees the arming pin. The slider assembly is then driven down by the spring onto the firing pin, initiating the primer which ignites the delay element. After a delay on 1.4 to 3 seconds the delay element causes the detonator to explode, bursting the body and scattering the filling over an area of 5 metres.

The grenade is painted grey with red markings and a red band. Markings include the designation, filling type, lot number, and date of filling. Early production grenades were not marked on the grenade itself, all markings were on the individual packing containers. The grenades are packed in individual containers with 50 containers per packing box.

CN-1 has a powerful lachrymal effect. It is irritating to the upper respiratory tract and in higher concentrations is irritating to the skin causing a burning and itching sensation. The gas begins to take effect in 15 to 30 seconds and the effects last from 5 to 20 minutes.

Grenade, Hand, Riot, CS1, ABC- M25A2
TYPE- Riot, Gas
WEIGHT- 8 oz.
LENGTH- including fuze- 3.4 in.
DIAMETER- 2.93 in.
FILLING- 2 oz. CS-1
IGNITER- C12 Integral
DELAY- 1.4- 3 sec.

The grenade body is constructed of two plastic hemispheres cemented together. The two halves form a burster well and slider housing in the centre of the body. A filling hole is located in the lower half, slightly offside to the centre and is closed by a threaded plug. The fuze is integral with the body. A safety pin fits through the arming sleeve and slider assembly locking the arming sleeve to the body and holding the arming pin in a horizontal position.

When the safety pin is removed the arming sleeve must be held against the body with the thumb or a finger. When thrown, the arming sleeve is free to separate from the body and frees the arming pin. The slider assembly is then driven down by the spring onto the firing pin, initiating the primer

which ignites the delay element. After a delay on 1.4 to 3 seconds the delay element causes the detonator to explode, bursting the body and scattering the filling over an area of 5 metres.

Bob Liendecker Collection

Markings are grey body with a red band and other markings in red. Other markings are the designation, filling type, lot number, and date of filling.

These grenades are packed in individual containers with 50 containers contained within an outer packing box.

CS-1 has powerful lachrymal effects. It is irritating to the upper respiratory tract causing coughing, breathing difficulties, and tightness in the chest. In heavy concentrations nausea and vomiting may occur. CS is more persistent than CN and has more severe reactions. The gas will begin to take effect in 15-30 seconds with the reactions lasting from 30 minutes to several hours.

Grenade, Hand, Fragmentation, M26

TYPE- Fragmentation
WEIGHT- 16 oz.
LENGTH- 4.125 in.
DIAMETER- 2.25 in.
IGNITER- M204A1 or M204A2
FUSE DELAY- 4-5 sec.
FILLING- 5.8 oz. Composition B
DANGER RADIUS- 15 meters

This grenade replaced the Mk. 2A1 as the standard American fragmentation grenade during the Korean War. The body is lemon shaped, smooth on the outside, with a flat base, and a threaded igniter well in the top. The outer casing is made of thin sheet steel. Contained within the outer casing is a serrated wire coil completely lining the outer casing. The wire is 1/8" thick and notched at intervals of 13/64" on the outer surface. This wire lining produces the fragmentation effects of the grenade. A filling of 5.5 ounces of Composition B is contained within the inner fragmentation liner.

When the safety pin is removed and the grenade thrown, the striker spring causes the striker to rotate on its axis pin, throwing the safety lever off in the process. The striker continues around until it strikes the primer, setting it off. The primer ignites the delay element which burns down to the detonator, the detonator explodes setting off a tetryl booster and in

turn the main explosive charge. The explosion causes the fragmentation liner to break up into many relatively uniform sized fragments and scatters them over an effective radius of 15 metres.

This grenade can be adapted for launching from a rifle with the attachment of an M1A1 or M1A2 adapter.

The grenade is painted olive green with a yellow band around the top. Markings in yellow give the designation, lot number, and date of production. The safety lever is olive drab with markings in black.

These grenades are packed in individual fibre containers (M289) which are marked with the designation, lot number, filling, and date of manufacture. A wooden case, containing 25 grenades is also marked with the same information.

Grenade, Hand, Fragmentation, M26A1
TYPE- Fragmentation
WEIGHT- 16 oz.
LENGTH- 4.125 in.
DIAMETER- 2.25 in.
IGNITER- M204A2
FUZE DELAY- 4-5 sec.
FILLING- 5.5 oz
Composition B

This model incorporates some minor modifications to improve fragmentation effects. The wire lining has been changed to a square wire, 1/8" thick which is notched at 1/8" intervals on the inner surface. The notching is also deeper. The only fuze mechanism used is the M204A2.

This grenade may be adapted for launching from a rifle with the attachment of an M1A1 or M1A2 adapter. The grenade is painted olive drab with a yellow band around the top and other markings in yellow. Markings on the body include the designation, filling, and lot number. The safety lever is painted olive drab with markings in black.

These grenades are packed individually in fibre containers with 30 containers in a wooden packing box.

Grenade, Hand, Fragmentation, Impact, M26A2
TYPE- Fragmentation
WEIGHT- 16 oz.
HEIGHT- 3.9 in.
DIAMETER- 2.25 in.
FILLING- 5.5 oz.
Composition B
IGNITER- M217 Impact

This grenade has the same style body as the M26 or M26A1 with the exception that the threading for the fuze is different to accommodate larger threading on the M217 fuze mechanism. The wire lining is a square steel wire, 1/8" thick deeply notched at 1/8" intervals on the inner surface. This grenade does not use a safety clip. The filling is Composition B as in the previous grenades but does not use the tetryl boosters.

When the safety pin is removed and the grenade thrown, the striker rotates on its axis pin throwing the safety lever off. It continues to rotate until the striker hits the primer and causes it to fire. The primer ignites a thermal power supply which builds up enough charge to fire the detonator after 1 or 2 seconds. After the delay period the grenade will detonate on impact. If for some reason the grenade does not detonate on impact the power supply which continues burning will detonate the grenade after a delay of 4 seconds. If the grenade still fails to fire the power supply becomes inactive after a delay of 30 seconds. Grenades equipped with the M217 impact fuze cannot be safely launched from a rifle.

The grenade is painted olive drab with a yellow band and other markings in yellow. Safety lever is red with "IMPACT" embossed on the upper portion or they may be found painted red with "IMPACT" stencilled on in black. These grenades are individually packed in fibre containers with 30 containers per wooden box.

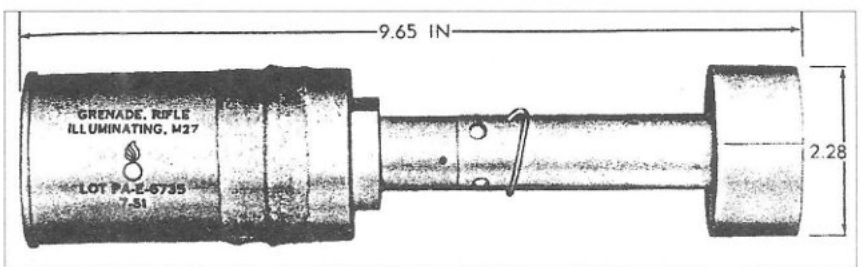
Grenade, Rifle, Illuminating, M27
TYPE- Rifle, Illumination
LENGTH- 9.65 in.
DIAMETER- 2.28 in.
FILLING- 8 oz. Illuminating Compound

This grenade has a cylindrical body and a stabilizer tube assembly similar to the M9A1 Anti-tank grenade.

A safety pin fits through the stabilizer tube assembly in the same manner as the M9A1 grenade. The body contains the illuminating compound filler, a base igniting fuze and a quick-match.

The body is marked with the Ordnance symbol, the type, designation, and lot number of the grenade. The body will be unpainted with black markings.

After firing, the grenade ignites upon impact and will illuminate an area of up to 240 yards diameter. The filling burns with an illumination factor of 80,000 candlepower for a period of 55 seconds.



Grenade, Rifle, Anti-tank, M28
TYPE- Anti-Tank
LENGTH- 15.5 in
DIAMETER- 2.9 in
FILLING- 12 oz.

This is the US version of the Belgian "ENERGA" anti-tank grenade. In all likelihood the American government simply bought specially marked supplies of the grenade from Belgium or Britain rather than producing their own. This particular type of grenade was used by a number countries including Great Britain and Canada as the No. 94 Mk. 1. In American service it was the interim grenade between the M9A1 and M31, providing an anti-tank grenade capable of defeating the armour of the time until the Americans developed their own.

The body of the grenade is made of aluminum, the tail assembly of cast aluminum. The tail assembly has six individual fin blades. The fuze mechanism uses a "PIBD" spitback fuze. The igniter is covered in transit by a plastic fuze cover.

The grenade is painted olive drab with yellow markings giving the designation, lot number, and date of manufacture.

Grenade, Rifle, Practice, M29
TYPE- Practice
WEIGHT- 24 oz.
LENGTH- 14.5 ins.
DIAMETER- 3 ins.
MAXIMUM RANGE- 150 meters

This grenade is used for firing practice. It is designed to duplicate the flight characteristics of the M28 HEAT rifle grenade. The grenade consists of two parts, the main body is made of cast iron and can be used repeatedly. The stabilizer tube assembly is made of steel with aluminum fins. During use the stabilizer tube assembly will become damaged and require replacement. Extra assemblies are available to replaced damaged assemblies and are easily replaced without special tools.

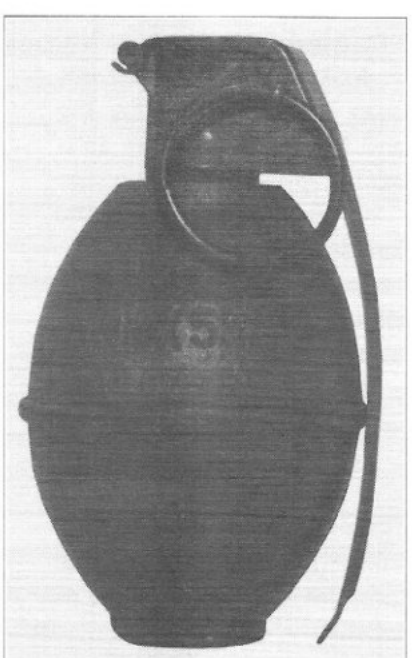
The grenade is painted black with white markings, it may also be found painted light blue with white markings.

The grenades are packed in individual containers within an outer packing box with a capacity of 20 grenades.

Norman Bonney Collection

Grenade, Hand, Practice, M30
TYPE- Practice
WEIGHT- 16 oz
HEIGHT- 4 in.
DIAMETER- 2 3/8 in.
FILLING- 21 grains Black Powder
IGNITER- M10A2, M10A3, M205A1, M205A2
FUSE DELAY- 4-5 sec

This grenade was designed to represent the M26 grenade, The body is made of cast iron. A hole in the top of the body is threaded to accept the igniter mechanism. An un-threaded hole in the bottom is used for inserting the practice charge and is closed by a plastic plug after loading. This grenade uses an igniting type fuze mechanism to ignite the black powder practice charge. This grenade is not used with a safety clip. When used, the fuze mechanism functions as normal, after a delay of 4-5 seconds the fuze ignites the practice charge and blows out the plastic plug. The ignition of the grenade produces a sharp report and puff of white smoke to indicate the simulated explosion of a grenade.



The body can be used many times by reloading it. The M30 is reloaded by replacing the expended igniter assembly, plastic stopper, washer, and 21 grain black powder charge. The powder charge is contained within a small cloth bag which is consumed by the ignition of the charge. The replacement parts are supplied in kit form separately from the body. After use the body must be inspected for cracks or damage. If found to be damaged the body must not be used

again as the possibility exists that the body could burst producing dangerous fragments.

The body is painted light blue, may have a brown band, and may have some markings in white. Normally the bodies are found with markings cast directly into the casting, for example "RFX55 T.5". The safety lever is painted light blue with a red lower tip and the top marked in black with the designation, lot number and date.

The grenades are packed in individual fibre containers with 30 containers within a packing box.

Grenade, Rifle, Anti-tank, M31

TYPE- Anti-tank, Rifle
WEIGHT- 25 oz.
LENGTH- 16.96 ins
DIAMETER- 2.61 in
IGNITER- M211 PIBD
FILLING- 9.92 oz Composition B
MAXIMUM RANGE- 185 meters

The M31 grenade consists of three main components, a body, stabilizer assembly, and fuze assembly. The body assembly is made of copper coated steel alloy and contains a piezoelectric assembly in the nose with a lead wire connecting it with the fuze. Composition B is moulded against a copper shaped charge liner. The M211 fuze with booster is contained in the base of the body. The fuze assembly consists of an arming rotor, spring driven contact, and booster pellet. The stabilizer tube assembly has an adapter at its forward end to connect it to the body. A set of four fins is located at the bottom end. Upon launching the grenade operates in the following manner.

-Inertia causes the first of three setback leaves in the arming rotor to overcome the tension of its spring, this releases the second leaf.

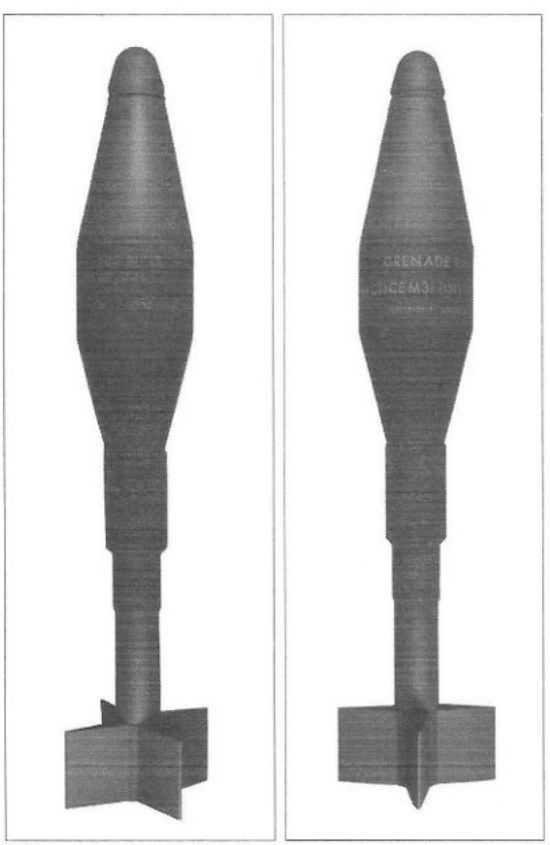
-The second leaf rotates, releasing the third leaf.

-The third leaf rotates, releasing the rotor assembly.

-The rotor assembly turns 90 degrees to close the firing circuit, which arms the grenade.

-Upon impact, the piezoelectric crystal is crushed, generating an electric current.

-The electric current



Two versions of the M31 rifle grenade. On the left is a live version, green painted with yellow lettering. On the right is a blue-painted practice grenade with white lettering .

Rex Gallogly Collection

is conducted through the lead wire to the fuze.

-The electric current sets off the detonator, which in turn, sets off the booster which initiates the main shaped charge.

The grenade is painted olive drab with yellow markings giving the model, type, lot number, and date of filling. Each grenade is packed in an individual fibre container (M354A2). A wooden box contains 10 grenades packed with 20 launching cartridges.

The grenade can be fired in direct fire to a maximum effective range of 115 metres, if used in the indirect mode, a range of 185 metres can be obtained. The shaped charge will penetrate 10 inches of homogeneous steel or 20 inches of reinforced concrete.

Grenade, Rifle, Practice, M31
TYPE- Practice, Rifle
WEIGHT- 25 oz.
DIAMETER- 2 5/8 in.

The grenade is made of sheet steel and aluminum in the same shape as the M31 Anti-tank grenade. There are no replacement parts for this grenade, if it becomes damaged it is no longer usable.

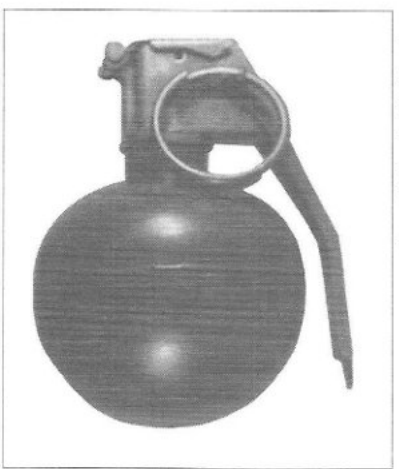
The grenade is painted light blue with white markings giving the model, type, lot number, and date. The grenades are packed in individual fibre containers (M354A2) without launching cartridges.

Grenade,Hand, Fragmentation, M33
TYPE- Fragmentation
WEIGHT- 13.9 oz.
LENGTH- 3.53 in.
DIAMETER- 2.5 in.
IGNITER- M213
FUSE DELAY- 4-5 sec.
FILLING- 6.5 oz.
Composition B

The body of this grenade is ball shaped and made of sheet steel. The inner surface of the body is pre engraved to produce fragments of a relatively uniform size and weight. The igniter mechanism screws into a bushing attached to the top. This grenade is not fitted with the safety clip.

The fragments of this grenade are effective out to a distance of 15 metres but can be dangerous to a much longer distance.

Because of the shape of the body, the average thrower can throw the grenade more accurately than earlier grenades. This grenade cannot be adapted for projection from a rifle.



Rex Gallogly Collection

The grenade is painted olive drab with yellow markings. Markings include a yellow band, designation, filler, and lot number. The safety lever is olive drab with black markings on top.

These grenades are packed in individual fibre containers with 30 containers per wooden box.

When the safety pin is pulled and the grenade thrown, the striker, under pressure from its spring rotates on its axis pin throwing the safety lever off. The striker continues to rotate until it strikes the primer. The primer fires, igniting the delay element which burns for four to five seconds. The delay element sets off the detonator which ignites and detonates the main charge.

Grenade, Hand, Smoke, WP, M34
TYPE- Smoke, W.P.
WEIGHT- 27 oz.
LENGTH- 5.2 in.
DIAMETER- 2 3/8 in.
IGNITER- M206A2
FUSE DELAY- 4-5 sec.
FILLING- 15 oz. White Phosphorous

The body is made of rolled steel and serrated on the outside to aid the body in breaking up on detonation. The base is tapered to enable the grenade to fit the Adapter, M1A1 or M1A2 and be launched from a rifle. The fuze mechanism screws into a threaded detonator well in the top of the grenade.

When the safety pin is pulled and the grenade thrown, the striker lever is released, allowing the striker to hit a percussion cap, igniting a delay fuze. The delay fuze burns down and initiates the detonator. The exploding detonator scatters the white phosphorous over an area of 35 metres. The phosphorous ignites upon contact with the air and burns at approximately 5000 degrees for 60 seconds. The burning phosphorous will ignite any flammable material it comes in contact with and inflict serious burns to any personnel in the immediate area. This grenade creates an almost instantaneous screen of thick white smoke.

White Phosphorous grenades are often used as all purpose grenades, providing good effects for Smoke, Incendiary, Anti-personnel, and Signalling.

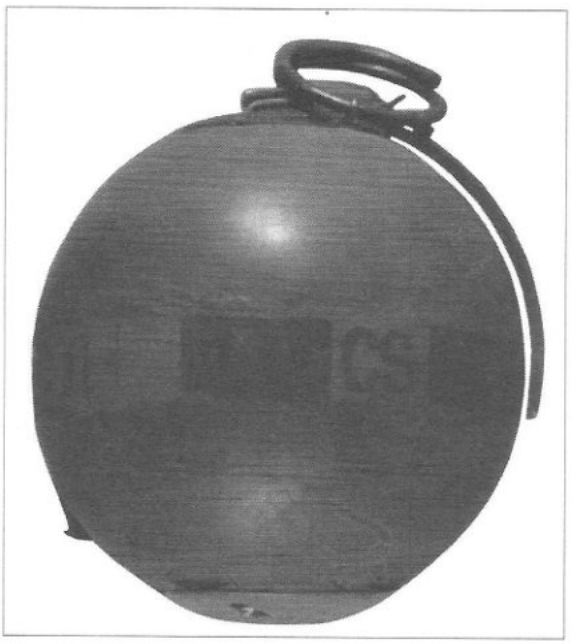
Older manufactured grenades are painted in the old colour code, grey body with yellow band and markings in yellow. Later manufactured grenades are painted Light green with a yellow band and markings in red. The safety lever is olive drab with fuze markings in black.

Grenade, Hand, Riot, CS, M47
TYPE- Gas
WEIGHT- 410 gr.
DIAMETER- 3.5 in.
FILLING- 155 gr. CS Pyrotechnic mix
IGNITER- M227
FUZE DELAY- 2.5-3.5 sec.

This grenade's body consists of two rubber hemispheres which are vulcanized together. The top half contains the fuze mechanism (M227). The safety lever conforms closely to the body shape. The safety pin and safety latch are located on top of the fuze mechanism. The bottom half of the body has a filling hole, closed by a plug, and the exhaust port, covered by a tape seal. The body is filled with approximately 155 grams of CS pyrotechnic mixture. The body is grey with a red band and markings in red. These grenades are packed 20 per packing box.

For use, remove the tape covering the exhaust port, pull the safety pin, and slide the safety latch rearward into the armed position. The safety lever is then free to separate from the grenade. When the grenade is thrown, the safety lever flies off releasing the firing pin. The firing pin, under pressure of a spring strikes and initiates a primer which starts the delay element. The delay element burns down and initiates the ignition mixture. The

ignition mixture burns through an aluminum foil shield and ignites the granulated CS mixture. The pressure of the burning mixture force the CS gas out the exhaust port and disperses the agent. The gas will be emitted for between 5 and 25 seconds. The jet action of the gas being forced out of the exhaust port cause the grenade to move erratically along the ground making it difficult to pick up and throw back.



Rex Gallogly Collection

The CS gas is irritating to the upper respiratory tract, causing coughing, difficulty in breathing, and a tightness in the chest.

Grenade, Hand, Smoke, Coloured, M48
TYPE- Smoke
WEIGHT- 390 gr.
DIAMETER- 3.5 in.
FILLING- 165 gr. Red Smoke Mixture
IGNITER- M227

This grenade is exactly the same as the M47 gas grenade. The M48 is used as a training version during exercises. The grenade body consists of two rubber hemispheres which are vulcanized together. The top half contains the fuze mechanism (M227). The bottom half has the filling plug and exhaust port. The safety lever conforms closely to the body shape. The safety pin and safety latch are located on top of the fuze mechanism. The grenade body is light green with a black band and black markings.

Bob Liendecker Collection

These grenades are packed 20 per packing box. For use, remove the tape covering the exhaust port, pull the safety pin, and slide the safety latch into the armed position. The safety lever is then free to separate from the grenade. When the grenade is thrown, the safety lever flies off releasing the firing pin. The firing pin, under

pressure of a spring strikes and initiates a primer which starts the delay element. The delay element burns down and initiates the ignition mixture. The pressure of the burning gases force the smoke mixture out the exhaust port and disperses the agent. When activated the grenade will produce red smoke for 5-25 seconds. The jet action of the smoke being forced out of the exhaust port cause the grenade to move erratically along the ground.

Grenade, Hand, Riot, M54
TYPE- Gas
WEIGHT- 16 oz
LENGTH- 5.75 in
DIAMETER- 2.5 in
IGNITER- M226
FUSE DELAY- 8-12 sec
FILLING- 4.2 oz CS Pellets

The body of this grenade is made of 28 gauge sheet steel with a single emission hole in the bottom of the grenade. The emission hole is closed by a square of pressure sensitive tape. The grenade is conventional in looks and functioning. The major difference being in the delay element of the fuze which gives a delay of 8-12 seconds.

The grenade is painted grey with markings in red. Markings on the body give the model, type, and lot number of the grenade. The safety lever is olive drab with black markings giving the fuze model and lot number.

The filling is a mixture of CS pellets and a burning mixture. The CS gas produced is irritating to the upper respiratory tract which will cause coughing, breathing difficulty, and chest tightness. A heavy dosage will cause nausea and vomiting.

Grenade, Hand, Fragmentation, M56
TYPE- Fragmentation
WEIGHT- 15.2 oz.
LENGTH- 3.9 in.
DIAMETER- 2.25 in.
IGNITER- M215
FILLER- 6.3 oz.
Composition B

This is a modification of the M26A1 to accommodate the larger threading on the M215 fuze mechanism and with the addition of a safety clip. The body is basically lemon shaped and made of thin sheet steel. A pre notched fragmentation liner provides the fragmentation effects of the grenade. The wire lining is a square steel wire, 1/8" thick which is notched at 1/8" intervals on the inner surface. This grenade contains slightly more Composition B than the M26A1.

The grenade is olive drab with yellow markings. Markings on the body include a yellow band around the top, designation, filling, and lot number. The fuze is marked on the top of the olive drab safety lever in black.

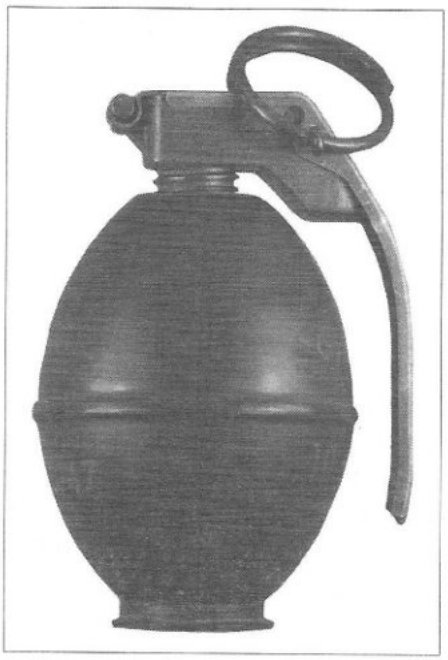
Grenade, Hand, Fragmentation, Impact, M57
TYPE- Fragmentation
WEIGHT- 16 oz.
LENGTH- 3.9 in.
DIAMETER- 2.25 in.
IGNITER- M217 Impact
FILLING- 6.3 oz.
Composition B
DANGER RADIUS- 15 meters

This is a modification of the M56 grenade which incorporates the M217 impact fuze mechanism. In fact, the body configuration is exactly the same with the exception of different fuze threading. The fuze mechanisms are not interchangeable. The steel wire lining is a square wire, 1/8" thick which is deeply notched at 1/8" intervals on the inner surface. When the grenade explodes the lining provides a very effective fragmentation effect.

The grenade body is painted olive drab with yellow markings. Markings include a yellow band at the top, the designation, filler type, and lot number. The safety lever is painted red with the word "IMPACT" embossed on the lever near the top. Markings in black will also be found on the top of the lever. The lever may also be found painted red with or without "IMPACT" stencilled in black.

When the grenade is thrown and the lever released, the striker fires a standard percussion primer which activates a thermal power supply. The power supply arms the impact fuze in approximately 1 second, after which the grenade operates on impact. These grenades must be thrown to a minimum height of 4.5 metres to give the required flight time to arm and sufficient impact to ensure detonation. If the grenade fails to detonate on impact, a secondary pyrotechnic delay will explode the grenade after a delay of 4 seconds.

The grenades are packed in individual fibre containers in a wooden crate with a capacity of 30 grenades.



Rex Gallogly Collection

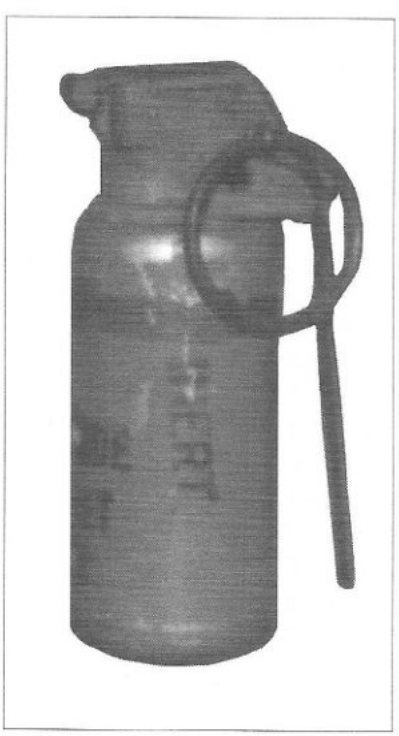
Grenade, Hand, Riot, Pocket, CS, M58
TYPE- Riot, Gas
WEIGHT- 4 oz
LENGTH- 3.26 in
DIAMETER- 1.31 in.
FILLING- 1.4 oz CS Pyrotechnic compound
IGNITER- M201A1E1
FUSE DELAY- 0.7-2.0 sec

The body of this grenade is a thin walled, two piece, aluminum cylinder. Constructed in two parts, the upper body fits over the lower body. The upper body has a hole, slightly off centre, to fit the fuze mechanism. A nut on the inside is threaded to fit the threads of the fuze. The lower body has a central hole in the base covered by a pressure sensitive tape. Safety clips are not required with this grenade.

The grenade emits CS gas for 8-28 seconds. The gas is irritating to the upper respirator tract and causes coughing, breathing difficulty, and tightness in the chest. Heavy concentrations will also cause nausea and vomiting.

The grenade is painted grey with a red band and red markings. The fuze mechanism is olive drab with markings in black.

The grenade comes packed 10 per fibreboard box with 10 boxes in an outer packing case giving a total of 100 grenades per case.

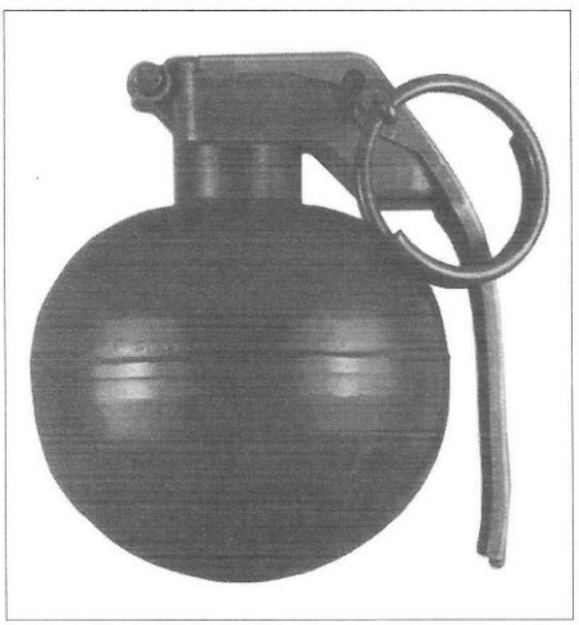


Rick Larson Collection

Grenade, Hand, Fragmentation, Impact, M59
TYPE- Fragmentation
WEIGHT- 14 oz.
LENGTH- 3.2 in
DIAMETER- 2.5 in.
FILLING- 6.5 oz Composition B
IGNITER- M217

This grenade uses the same body as the M33 grenade and in fact is sometimes called the M33A1. The difference between the two is the M217 "Electric Impact Detonating Fuze" used in the M59 rather than a time delay fuze as in the M33. The body is a 2.5 inch diameter steel sphere designed to burst into a large number of fragments when the grenade detonates. A charge of 6.5 ounces of Composition B is contained within the body.

The arming time of the fuze mechanism is effected by temperature. At temperatures above 125 degrees the arming time may be a little as one second. At temperatures of -40 degrees it may be as long as two seconds. The secondary pyrotechnic delay will operate in a range of three to seven seconds throughout that temperature range.



Rex Gallogly Collection

If the grenade does not detonate on impact, the secondary delay feature will detonate the grenade as in normal time delay grenades. If the fuze fails to function after the safety lever is released, the power supply becomes inactive within 30 seconds.

The grenade is painted olive drab with yellow markings. The safety lever is olive drab with "IMPACT" embossed on the upper portion of the lever or it may be painted red with or without the word "IMPACT" stencilled in black on the lever.

The grenade is packed in individual fibre containers with 30 containers per wooden packing case.

Grenade, Hand, Fragmentation, M61
TYPE- Fragmentation
WEIGHT- 16 oz.
LENGTH- 3.9 in. w/o fuze
DIAMETER- 2.25 in.
IGNITER- M204A1, M204A2
FUSE DELAY- 5 sec.
FILLING- 5.5 oz. Composition B

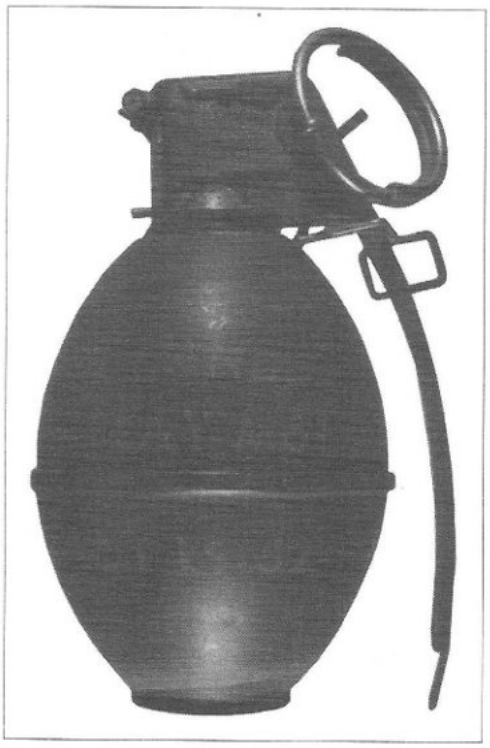
This grenade is basically the M26A1 with the addition of a safety clip. The two piece sheet steel body contains a closely wound coil of square steel wire which provides the fragmentation effects. The wire lining is a square wire, 1/8" thick which is deeply notched at 1/8" intervals on the inner surface. This grenade is fitted with a safety clip, of spring steel wire. The clip fits around the fuze body and over the safety lever. The M61 grenade has a lethal radius of 18 metres and a danger radius of up to 300 metres.

This grenade may be adapted for launching from a rifle by mounting it on the M1A2 adapter.

The body of the grenade is painted olive drab with all markings in yellow. The safety lever is olive drab with markings in black giving the

model, lot number, and date of the fuze.

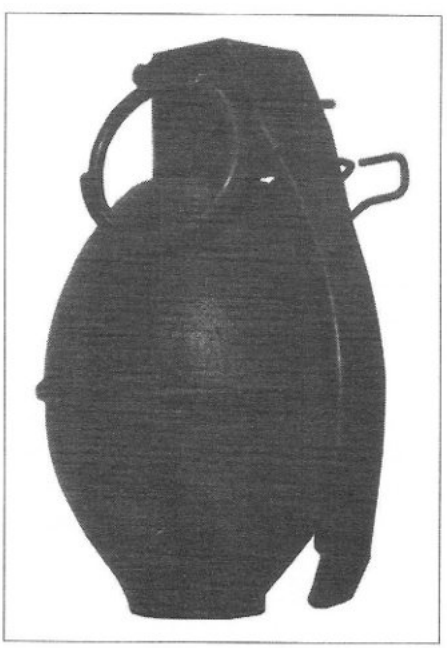
The grenades are packed in individual fibre containers (M289A2). A total of 30 containers fit into a wooden outer packing box.



Rex Gallogly Collection

Grenade, Hand, Practice, M62
TYPE- Practice
WEIGHT- 16 oz.
HEIGHT- 3.9 in.
DIAMETER- 2.25 in.
IGNITER- M205A1 or M205A2

This is designed to be a practice version of the M61 grenade. The basic configuration is that of the M30 grenade with the addition of a safety clip. The body is made of cast iron with a hole in the top threaded to accept the fuze mechanism. An unthreaded hole in the bottom is used for inserting the practice charge and is closed by a plastic plug after loading. This grenade uses an igniting type fuze mechanism to ignite the black powder practice charge. This grenade is required to have the safety clip to properly represent the M61 grenade which is always issued with the clip. When used, the fuze mechanism functions as normal, after a delay of 4-5 seconds the fuze ignites the practice charge and blows out the plastic plug. The ignition of the grenade produces a sharp report and puff of white smoke to indicate the simulated explosion of a grenade.



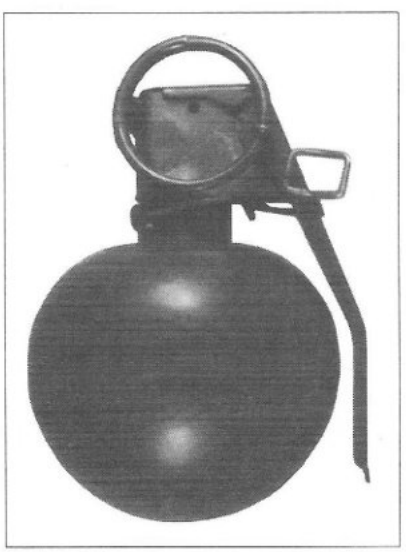
The body can be used many times by reloading it. The M62 is reloaded by replacing the expended igniter assembly, plastic stopper, washer, black powder charge, and safety clip. The powder charge consists of 37.5 grains of black powder and is contained within a small silk or cloth bag. The replacement parts are supplied in kit form separately from the body. After use the body must be inspected for cracks or damage. If found to be damaged the body must not be used again as the possibility exists that the body could burst

producing dangerous fragments.

The body is painted light blue and may have some markings in white. Normally the bodies are found with markings cast directly into the casting, for example "RFX55 T.5". The safety lever is painted light blue with a red lower tip and the top marked in black with the designation, lot number and date.

The grenade bodies and fuze mechanisms are normally issued as separate items. The bodies are packed in wooden packing boxes containing 30 bodies. The fuze mechanisms are packed in wooden boxes containing 360 fuze mechanisms and 360 powder bags.

Note that FM 23-30, dated 27 December 1988, states that the M228 fuze is utilized with this grenade. However, use of the M228 fuze mechanism would mean the grenade bodies would have to be rethreaded to accept the larger threading of the fuze mechanism.



Early style safety clip (modified M33)
Rex Gollogly Collection

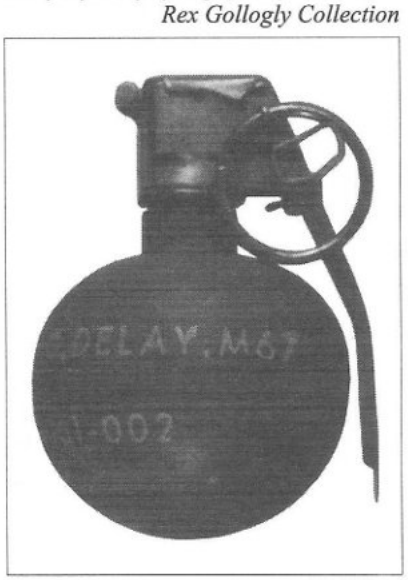
Grenade, Hand, Fragmentation, M67
TYPE- Fragmentation
WEIGHT- 13.9 oz.
LENGTH- 3.53 in.
DIAMETER- 2.5 in.
IGNITER- M213
FUSE DELAY- 4-5 sec.
FILLING- 6.5 oz.
Composition B

This grenade is a slightly improved model of the M33 grenade. The body is a steel sphere which will burst into a large number of fragments when the grenade is detonated. The body is filled with 6.5 ounces of Composition B. The M213 fuze mechanism screws into the top of the grenade. This grenade has a new style safety clip which clips over the safety lever and a small projection on the bottom of the fuze body. When released, this type of clip is completely removed from the grenade.

The grenade is painted olive drab with yellow markings. The markings include a band, designation, filler type, and lot number. The safety lever is olive drab with black markings, giving the model and lot number.

This grenade cannot be adapted for launching from a rifle.

These grenades are normally packed individually in fibre containers (M415A1) with 30 containers in a wooden case. Each container is marked with the designation, fuze type, filler type, and lot number.



Grenade, M67 with Late style safety clip.
Rex Gollogly Collection

Grenade, Hand, Fragmentation, Impact, M68
TYPE- Fragmentation
WEIGHT- 14 oz.
LENGTH- 3.2 in.
DIAMETER- 2.5 in.
IGNITER- M217
FILLING- 6.5 oz.
Composition B

This grenade is a modification of the M67 grenade to incorporate an impact fuze mechanism. The body is exactly the same, a 2.5 inch diameter steel sphere designed to break up into a large number of fragments upon detonation. The fuze mechanism is the M217 electrical impact fuze. A safety clip is also fitted to the grenade to prevent accidental functioning.

With the M217 fuze mechanism, in temperatures above 125 degrees, the arming delay may be as short as one second, and below 40 degrees it may be as long as two seconds. The secondary delay train functions within 3-7 seconds throughout that range of temperature.

The grenade is painted olive drab with yellow markings. The striker lever is red with black markings and has the word "IMPACT" embossed near the top of the lever. The safety lever may also be found painted olive drab with the same type of markings.

The grenades are individually packed in fibre containers within a wooden outer packing case containing 30 grenades.

Grenade, Hand, Practice, M69
TYPE- Practice
WEIGHT- 14 oz.
DIAMETER- 2.5 in.
HEIGHT- 3.5 in.
IGNITER- M228
FUZE DELAY- 4-5 sec.

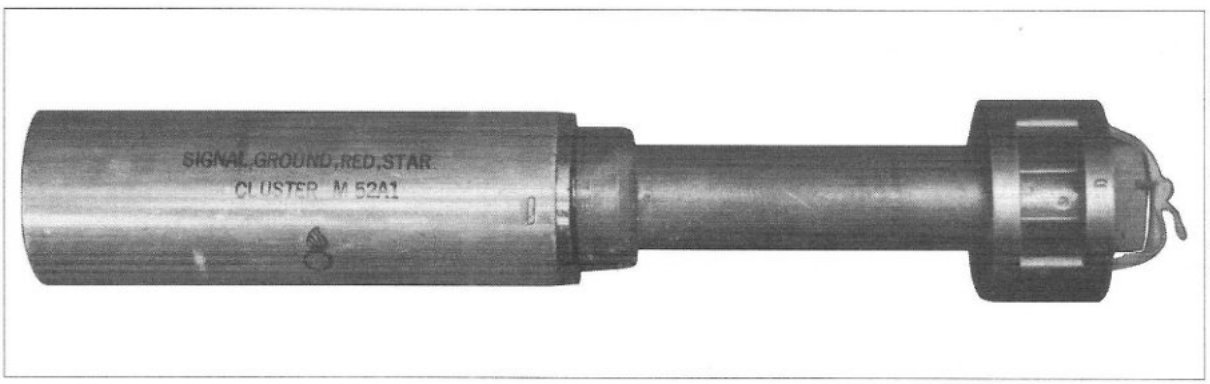
This is the practice version of the M67 grenade. The body is made of steel in two parts and welded together in the middle. A hole in the base of the grenade allows the gases and smoke from the practice charge to escape. A bushing attached to the top is internally threaded to fit the fuze mechanism. The M228 fuze mechanism incorporates the practice charge, eliminating the separate charges used in previous practice grenades. These grenades may be fitted with either type of safety clip.

The body is painted light blue with markings in white. Markings on the body include the type and NATO stock number. The M228 fuze body is green and the safety lever is light blue with a red tip and markings in black. Markings on the safety lever include the model, lot number, and filling date.

The grenade bodies and fuze mechanisms are normally issued separately. The bodies are packed in wooden boxes containing 50 bodies. The M228 fuze mechanisms are packed in trays containing 45 mechanisms. A wooden box contains 8 trays giving a total of 360 fuze mechanisms per wooden box.

Signal, Ground
TYPE- Signal
WEIGHT- 16 oz.

These signals consist of two main parts, the signal case and the stabilizer tube. The signal case is either aluminum (designated by the suffix A1) or steel (designated by the suffix A1B2). The top end is closed by a steel closing cap. The stabilizer tube consists of a hollow tube, sized to fit the grenade launching attachment, and a set of fins to provide



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stability in flight. The launching tube is closed by a cork in transit or storage.

A propelling charge is contained in the base of the signal. The thrust provided by the M3 Grenade Launching Cartridge is not enough to propel the signal to the desired altitude. The additional thrust is provided by the propelling charge, ignited by the flash of the launching cartridge. It will send the signal to a height of 180-215 metres. At the same time, the propelling charge ignites a delay element of 5.5 seconds. The delay element ignites the expelling charge that ejects the signal it at a minimum height of 180 metres and ignites it at the same time.

Signal, Illumination, Ground, Parachute-

Consists of a single, parachute supported flare. The star will burn for 20-30 seconds. The white star is useful for illumination purposes. Signal casing is unpainted with black markings. The closing cap is painted in the colour of signal and has raised lettering for night identification. The stabilizer tube and fins are painted green.

M17A1 or **M17A1B2-** White star, cap is painted white with a raised "WP".

M19A1, M19A2, M19A1B2, or **M19A2B2-** Green star, cap is painted green with a raised "GP"

M21A1 or **M21A1B2-** Amber star, cap painted amber with a raised "AP".

M51A1 or **M51A1B2-** Red star, cap is painted red with a raised "RP".

Signal, Illumination, Ground, Cluster-

Consists of five free falling stars which burn for 4-10 seconds. Signal case is unpainted with black markings. The closing cap is painted the colour of the signal and has raised letters for night identification. The stabilizer tube and fins are painted green.

M18A1, M18A2, M18A1B2, or **M18A2B2-**

White star cluster, cap is painted white with raised "WS".

M20A1 or **M20A1B2-**

Green star cluster, cap is painted green with a raised "GS".

M22A1 or **M22A1B2-**

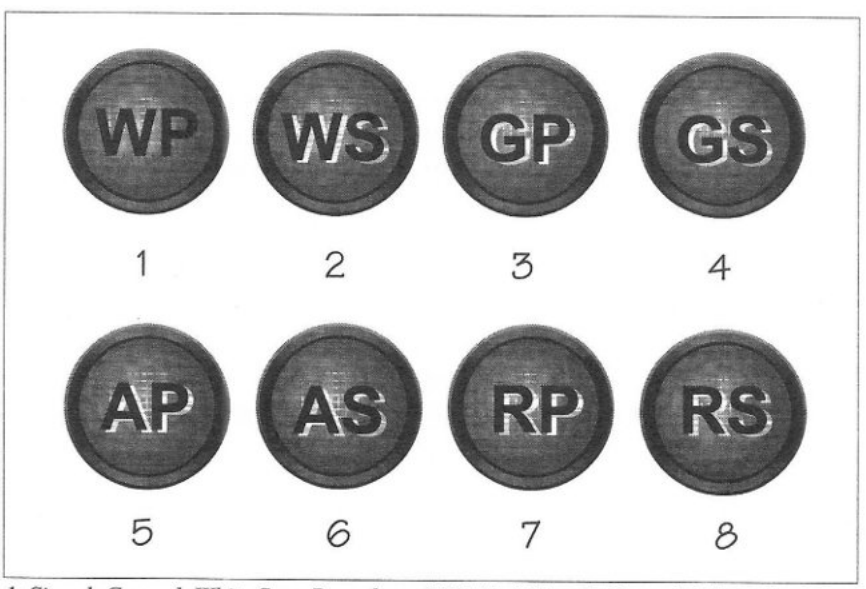
Amber star cluster, cap is painted amber with a raised "AS".

M52A1, M52A2, M52A1B2, or **M52A2B2-**

Red star cluster, cap painted red with a raised "RS".

Signal, Smoke, Ground, Streamer-

Similar to the star cluster, this signal ejects six smoke pellets. The pellets burn for 4-8 seconds leaving a stream of coloured smoke approximately 75 metres long. The signal casing is unpainted with black markings and a narrow band, painted the colour of the smoke, at the top end. The closing cap is also painted the colour of the smoke. The stabilizer tube and fins are painted green.



1. Signal, Ground, White Star, Parachute, M17A1. 2.Signal, Ground, White Star, Cluster, M18A1. 3. Signal, Ground, Green Star, Parachute, M19A1. 4. Signal, Ground, Green Star, Cluster, M20A1. 5. Signal, Ground, Amber Star, Parachute, M21A1. 6. Signal, Ground, Amber Star, Cluster, M22A1. 7. Signal, Ground, Red Star, Parachute, M51A1. 8. Signal, Ground, Red Star, Cluster, M52A1

VB Signals, U.S. Army
TYPE- Signal

While little information is available for these signal grenades, the system of marking is noted below. These signals and markings listed are for those used by the U.S. Army and are separate from those used by the U.S. Navy. This system of marking is known to have been used in the period 1918 to 1921. These signals are designed to be launched from the VB discharger cup.

-Single White Star- Painted olive drab with a white closing disc. Raised "W" in the centre of the closing disc.

-Single Red Star- Painted olive drab with a red closing disc. Raised "R" in the centre of the closing disc.

-Single Green Star- Painted olive drab with green closing disc. Raised "G" in the centre of the closing disc.

-Triple White Star- Painted olive drab with a white closing disc. The closing disc has a concave centre with three raised dots equally spaced around the uppermost portion.

-Triple Red Star- Painted olive drab with a red closing disc. The disc has three consecutively raised concentric rings and three raised dots equally spaced around the outer ring.

-Triple Green Star- Painted olive drab with a green closing disc. The disc has a convex surface with three raised dots spaced around the outer edge.

-Six White Star Cluster- Painted blue grey with a white closing disc. The disc has a concave centre with six raised dots equally spaced around the uppermost portion.

-Six Red Star Cluster- Painted blue grey with a red closing disc. The disc has three consecutively raised concentric rings and six raised dots equally spaced around the outer ring.

-Six Green Star Cluster- Painted blue grey with a green closing disc. The disc has a convex surface with six raised dots spaced around the outer edge.

-Single White Star Parachute- Painted olive drab with a white closing disc. The closing disc has a concave centre.

-Single Red Star Parachute- Painted olive drab with a red closing disc. The disc has three consecutively raised concentric rings.

-Single Green Star Parachute- Painted olive drab with a green closing disc. The disc has a convex surface.

-Fourteen White Star Caterpillar with Parachute- Painted olive drab with a white closing disc. The disc has a concave centre and five raised dots within a 45 degree arc. Three dots are near the outside and two on the inside of the highest portion of the disc.

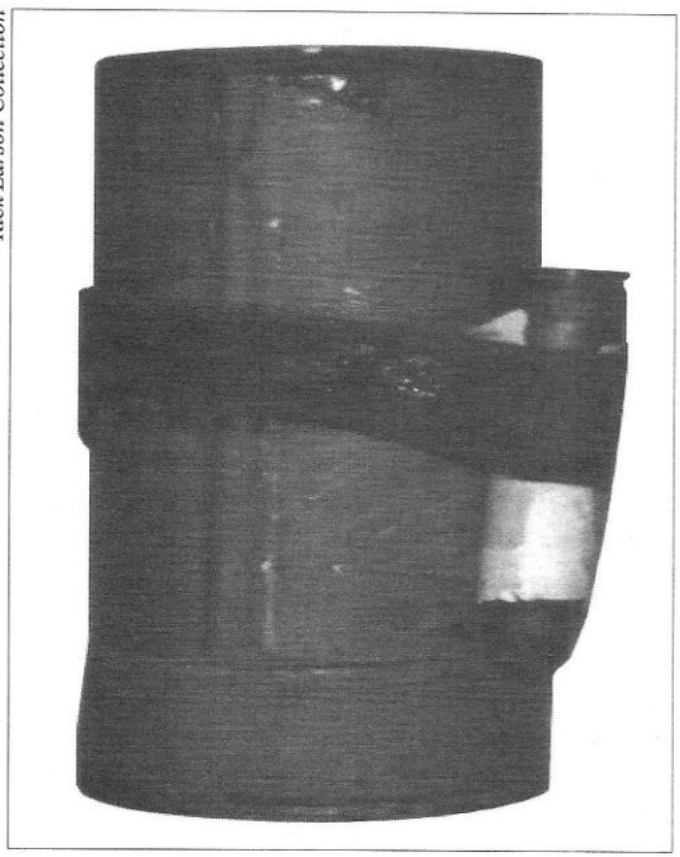
-Fourteen Red Star Caterpillar with Parachute- Painted olive drab with a red closing disc. The disc has a three consecutively raised rings and five raised dots within a 45 degree arc. Three dots on the outside ring and two on the middle ring.

-Fourteen Green Star Caterpillar with Parachute- Painted olive drab with a green closing disc. The disc has a convex surface and five raised dots within a 45 degree arc. Three dots are near the outside and two near the centre between the outer dots.

-Yellow Smoke Parachute- Painted olive drab with a flat surfaced yellow closing disc.

VB Signals, U.S. Navy
TYPE- Signal

While little information is available for these signal grenades, the system of marking is noted below. These signals and markings listed are for those used by the U.S. Navy and are separate from those used by the U.S. Army. This system of marking is known to have been used in the period 1918 to 1921. These signals are designed to be fired from the VB discharger cup mounted on a rifle.



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-Twelve White Star Cluster- Painted olive drab with an olive drab wooden closing plug with a conical end.

-Twelve Red Star Cluster- Painted olive drab with a red wooden closing plug with three consecutively raised rings on the end.

-Twelve Green Star Cluster- Painted olive drab with a green wooden closing plug with a convex end.

-Double Red Star Cluster- Painted with two one inch red discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Double Green Star Cluster- Painted with two one inch green discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Double Yellow Star Cluster- Painted with two one inch yellow discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Red Star Cluster- Painted with three one inch red discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Green Star Cluster- Painted with three one inch green discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Yellow Star Cluster- Painted with three one inch yellow discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Red, Green, Yellow Star Cluster- Painted with one red, one green, and one yellow one inch discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Red, Yellow, Green, Star Cluster- Painted with one red, one yellow, and one green one inch discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Green, Red, Yellow Star Cluster- Painted with one green, one red, and one yellow one inch discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Green, Yellow, Red, Star Cluster- Painted with one green, one

yellow, and one red one inch discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Yellow, Red, Green, Star Cluster- Painted with one yellow, one red, and one green one inch discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Triple Yellow, Green, Red Star Cluster- Painted with one yellow, one green, and one red one inch discs lengthwise on the body and a three inch white arrow pointed toward the top of the projectile.

-Red Smoke Parachute- Painted with one red band, two inches wide around the centre of the projectile and one white arrow, three inches long, pointing toward the top of the projectile.

-Green Smoke Parachute- Painted with one green band, two inches wide around the centre of the projectile and one white arrow, three inches long, pointing toward the top of the projectile.

-Yellow Smoke Parachute- Painted with one yellow band, two inches wide around the centre of the projectile and one white arrow, three inches long, pointing toward the top of the projectile.

-Blue Smoke Parachute- Painted with one blue band, two inches wide around the centre of the projectile and one white arrow, three inches long, pointing toward the top of the projectile.

-Black Smoke Parachute- Painted with one black band, two inches wide around the centre of the projectile and one white arrow, three inches long, pointing toward the top of the projectile.

Grenade, Hand, Fragmentation, T13, "Beano"
TYPE- Fragmentation
WEIGHT- 11.9 oz.
DIAMETER- 2.86 in.
FILLING- 4.6 oz. Composition A
IGNITER- T5
EFFECTIVE RADIUS- 20 metres

This grenade was developed by the National Defence Research Committee on the request of the Office of Strategic Services (OSS). The characteristics for the grenade were defined as:

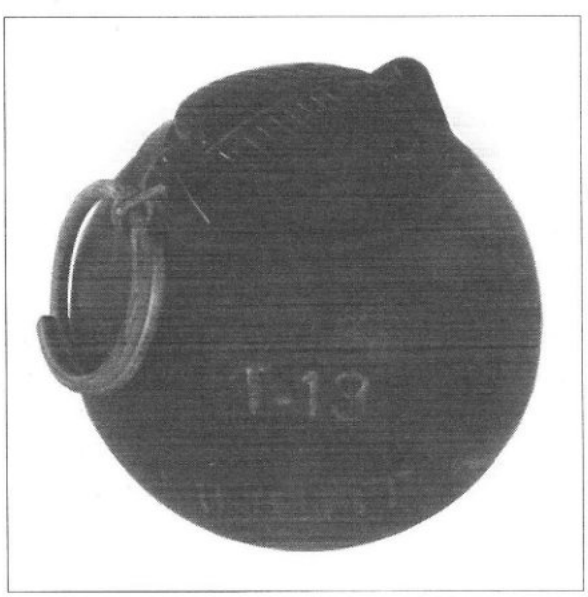
1- It should be a spherical grenade of approximately 2 7/8 inch diameter.

2- It should have a weight of 11 + or - 1 ounce.

3- It should be spherically balanced and not exhibit eccentricity in flight.

4- It should fire upon impact with preferred sensitivity such that a free fall of 18 inches onto a sponge rubber surface will cause detonation.

5-It shall have optimum lethal fragmentation.



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6- It shall have two arming mechanisms, the second and final arming to take place during flight. The initial arming shall be reversible.

Based on the criteria listed above, the T13 grenade was developed. Initially it was named the "Beano" prior to the assignment of proper Ordnance nomenclature on January 19, 1944.

This grenade is spherical in shape, made of steel 0.04 inch thick. The fuze mechanism fits into a well in the grenade and is almost flush with the rest of the body. Two projections on the fuze head hold the safety pin over the cap retaining it in place. The cap has a knurled appearance with a slot down the centre for the safety pin to fit along. The grenade could be filled with either of two fillings 4.6 ounces of Composition A, or four ounces of granular TNT.

The grenade is painted olive drab with markings in yellow. Markings include the designation, model, lot number, and filling date.

Fuze, Grenade, Impact, T5-

After the safety pin is removed the cap is held down under the fingers. When the grenade is thrown, the cap is forced away from the body by the cap spring. The cap acts as a drogue, unwinding a string attached to the arming pin. When the string is fully unwound it pulls out the arming pin arming the fuze. Pulling the arming pin allows the two retaining balls to recede into the firing pin assembly and allow movement of the firing pin. Arming will take place between 15 and 25 feet from the thrower. Any impact will then detonate the grenade regardless of which part of the grenade hits first. This fuze was found to function poorly in winter conditions, the fuze would stick and the snow provided enough cushioning to prevent discharge. The use of this fuze also caused a number of casualties during testing.

Fuze, Grenade, Impact, T5E2-

This was an improvement on the T5. This is the fuze that equipped the grenades that were sent to Europe for testing in March 1945. The fuze body is made of Bakelite. During the testing stage 2742 grenades were thrown. Out of that number 10 percent were duds due to the cushioning effects of soft ground. Again there were a number of casualties and two deaths caused by the grenade.

Fuze, Grenade, Impact, T5E3-

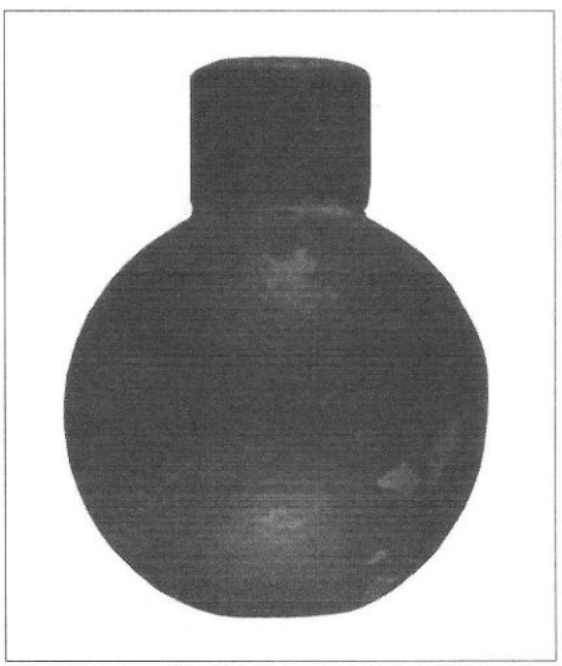
This fuze was designed to prevent premature detonation of the grenade. The fuze body was zinc and a safety lever was added to ensure the cap was held on until the grenade left the hand. This fuze also penetrated deeper into the grenade to correct the centre of gravity of the grenade. It was found that the earlier fuses being slightly off centre contributed to premature detonation. The spin of the grenade causing the fuze to function. This fuze corrected those deficiencies.

This grenade was never put into regular production.

Grenade, Hand, Offensive, T15
TYPE- Offensive
WEIGHT- 12.5 oz.
DIAMETER- 2 7/8 in.
IGNITER- T14
FUSE DELAY- 5 sec.
FILLING- 7 oz. RDX

This grenade was designed as an offensive grenade with a limited danger radius for use by troops in the open or where adequate cover was not available. The grenade has a larger blast than other grenades of the period but the fragments produced are only effective up to 10 ft. from the point of burst.

The body is a spherical cast magnesium alloy with walls 3/16 inch thick. A threaded fuze well is located on the top and a threaded filling hole on the bottom. The filling hole is closed by a magnesium plug. The fuze mechanism is virtually all magnesium. A spring steel safety clip engages under the striker head. A flexible wire attaches the clip to a magnesium cap which covers the fuze. The cap is secured to the grenade by a bayonet type lock and is waterproofed by a neoprene gasket under the cap.



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It was proposed that a steel fragmentation sleeve be provided which could be easily removed by the thrower. the grenade could then be used in either the offensive or defensive role.

The grenade is painted olive drab with yellow markings on the body and black markings on the firing pin head. Markings on the body include the designation and lot number.

Removal of the cap also pulls off the safety clip, the head is then struck with or on any convenient hard object. This sets off a primer which starts the delay fuse. The delay train burns down to the detonator which sets off a tetryl booster and in turn the main charge.

This grenade was not adopted for use.

Grenade, Rifle or Hand, HE, AT, T16
TYPE- Dual Purpose
WEIGHT- 22 oz.
LENGTH- 12 3/8 in.
FILLER- 7.9 oz. cast HE

This grenade was designed during the Second World War as a substitute for the M9A1 and Mk.2 grenade. As such it was supposed to fill both roles, as a rifle launched A.T. grenade and a hand thrown grenade. It also had the capability of being fired from the rifle to provide a 5 second delay airburst for use against personnel.

The head is constructed of a steel ogive, cone and body, all of which are

welded together with a smooth joint. There are six longitudinal grooves in the ogive for added strength. The stabilizer tube assembly consists of a strong aluminum tube, improved aluminum fin, and a combination fuze made of aluminum. The fuze combines an impact fuze with a 5 second time delay fuze. Two strikers are provided in the fuze, one for impact, and one for the delay. Each striker has its own safety pin. An arming device, consisting of a blow out plug, is provided for impact functioning. The plug engages the impact striker preventing forward movement.

For use as an anti-tank rifle grenade with impact ignition the forward safety pin is removed and the grenade fired from a grenade launcher in the normal manner. The gases from the grenade cartridge blow out the arming plug at the same time they launch the grenade. When the plug is blown out the grenade is armed and upon striking the target or the ground the striker will be forced forward into the primer which sets off the detonator.

For use as a hand grenade the stabilizer tube and fin are unscrewed and removed, the rear safety pin removed, and firing pin sharply struck. This ignites the five second delay train which burns down to the detonator and detonates the grenade. Needless to say the grenade must be thrown immediately after striking the firing pin.

The grenade may also be used to cause airburst antipersonnel effects. The rear safety pin is removed and the grenade fired from a launcher in the normal manner. The firing pin will be driven forward by the gases from the grenade cartridge igniting the delay fuze. After the normal five second delay the grenade will explode.

The grenade is also provided with an independent powder delay train which is ignited whenever the grenade is fired from a rifle. This will detonate the grenade after a delay of ten seconds giving the grenade a self destruct feature.

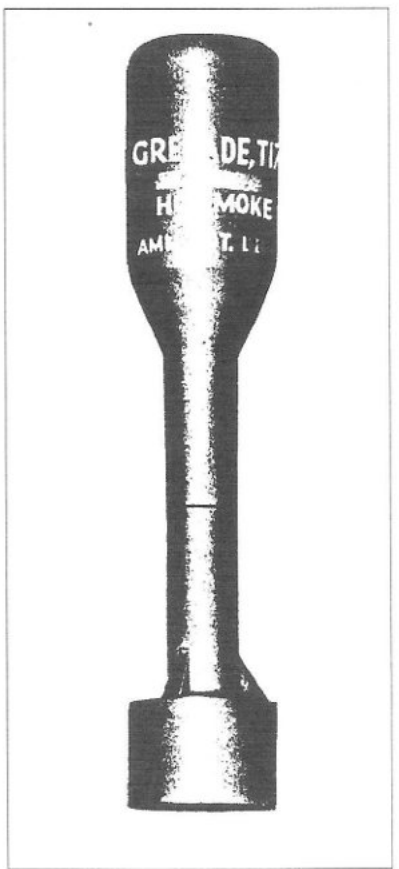
The grenade was painted olive drab with markings in yellow. The head is stencilled with the designation and lot number. Just above the forward safety pin the words "Rifle Impact" are stencilled in yellow and just below the rear safety pin "Hand or Rifle-Delay" is stencilled. The forward end of the stabilizer tube will be stencilled with "Unscrew for hand firing" and an arrow pointing to the left.

This grenade was not adopted for use.

Grenade, Rifle or Hand, Smoke, HC, T17
TYPE- Smoke
FILLING- 13.7 oz. HC smoke compound

This is a continuation of the series of combination grenades which began with the T16. This grenade is basically the same and functions in the same manner. The T16 grenade was meant to replace the M20 Smoke rifle grenade and provide a more effective smoke screen due to the larger amount of smoke compound.

This grenade was in the development stage in 1944 but it does not appear to have been carried past the developmental stage.



Grenade, Rifle or Hand, Smoke, WP, T19
TYPE- Smoke
WEIGHT- 22 oz.
LENGTH- 11 5/8 in.
FILLING- 12 oz. White Phosphorous
IGNITER- T1001

This grenade is similar in construction and operation to the T16. The the stabilizer tube, fins, and fuze are the same as used in the T16 with some minor changes to the fuze. The T1001 fuze has an attached burster instead of the booster pellet use in the T16 grenade with T13 fuze. The head is aluminum with an aluminum burster well extending a good distance into the head.

For use as an rifle grenade with impact ignition the forward safety pin is removed and the grenade fired from a grenade launcher in the normal manner. The gases from the grenade cartridge blow out the arming plug at the same time they launch the grenade. When the plug is blown out the grenade is armed and upon striking the target or the ground the striker will be forced forward into the primer which sets off the detonator and burster.

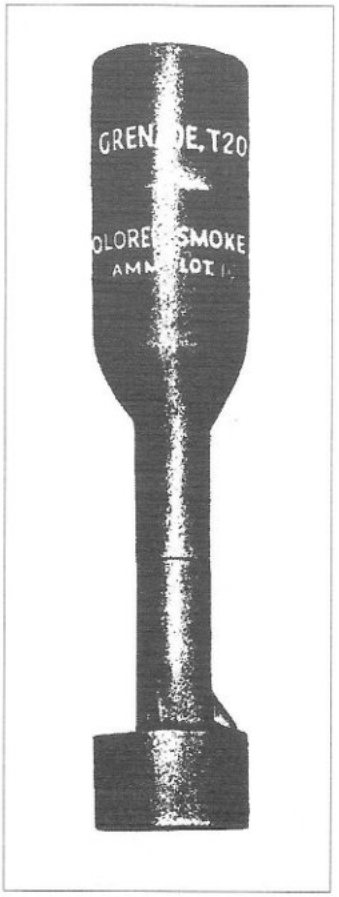
For use as a hand grenade the stabilizer tube and fin are unscrewed and removed, the rear safety pin removed, and firing pin sharply struck. This ignites the five second delay train which burns down to the detonator and bursts the grenade.

The grenade may also be used to cause airburst anti-personnel/smoke effects. The rear safety pin is removed and the grenade fired from a launcher in the normal manner. The firing pin will be driven forward by the gases from the grenade cartridge igniting the delay fuze. After the normal five second delay the grenade will burst and scatter the contents.

The grenade is also provided with an independent powder delay train which is ignited whenever the grenade is fired from a rifle. This will burst the grenade after a delay of ten seconds giving the grenade a self destruct feature.

The grenade was painted blue gray with the designation and lot number stencilled in yellow around the head. Just above the forward safety pin the words "Rifle Impact" are stencilled in yellow and just below the rear safety pin "Hand or Rifle-Delay" is stencilled. The forward end of the stabilizer tube will be stencilled with "Unscrew for hand firing" and an arrow pointing to the left.

This grenade was not adopted for use.



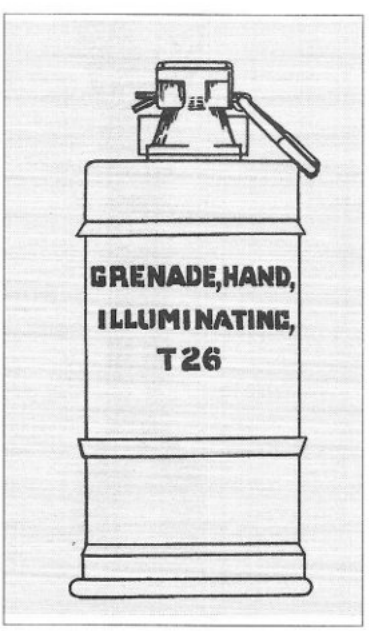
Grenade, Rifle or Coloured Smoke, T20
TYPE- Smoke
FILLING- 12.3 oz. coloured smoke compound

This is another continuation of the series of combination grenades which began with the T16. The grenade is basically the same and functions in the same manner as the others in the series. This grenade was meant to replace the M22 coloured smoke rifle grenade and provide a more effective smoke screen due to the larger amount of smoke compound. The T20 was to have been produced in four colours, red, yellow, green, and violet.

This grenade was in the development stage in 1944 but it does not appear to have been carried past the developmental stage.

Grenade, Hand, Illuminating, T26
TYPE- Illumination
WEIGHT- 21 oz.
FILLER- 11 oz. Illuminant composition
IGNITER- T18

The body is constructed of a cylindrical paper tube with stamped metal base and cap. The fuze mechanism screws into the cap. The fuze mechanism provides a delay of 2 seconds and contains a small charge of high temperature flash powder to ignite the filling. The filling is composed of a mixture of barium nitrate and aluminum powder covered with a first fire composition. A bead around the base of the grenade allows the grenade to be attached to an adapter and launched from a rifle or carbine.



The grenade operates in a similar manner as other grenades. When the fuze mechanism functions, after a delay of 2 seconds it ignites the flash powder, which in turn ignites the primed surface of the filling. The

grenade reaches its maximum candle-power after burning for approximately 12 seconds. During the 12 second delay the upper cover is burned off and after that the maximum candlepower is maintained for almost the entire burning time.

Developed during the second world war, some of these grenades were shipped overseas as "Flare, Hand, Illuminating, T14 and T14E1". The T14 version reaches a maximum of 45,000 candlepower and the T14E1 25,000 candlepower. The candlepower and burning time of the T26 is unknown. Burning time for the T14 was 55 seconds and 90 seconds for the T14E1.

The grenade was painted olive drab with the markings in black. This grenade was not adopted for service other than the limited issue as the T14/T14E1.

Grenade, Hand, Smoke, WP, T28
TYPE- Smoke
FILLING- 7.22 oz. white phosphorous

This is the white phosphorous version of the "Beano". The T13 "Beano" was first brought to the attention of the Army in January 1944. It was decided that if it were accepted for general service the Army would want a number of modifications, one of which is a desire for a WP "Beano". Work on the design was begun shortly after that. Initially the steel casings of the fragmentation grenade were tried but proved to be unsatisfactory. Plastic was proposed as a case material and also tested, this also proved to be unsatisfactory. Aluminum was then tested and proved acceptable.

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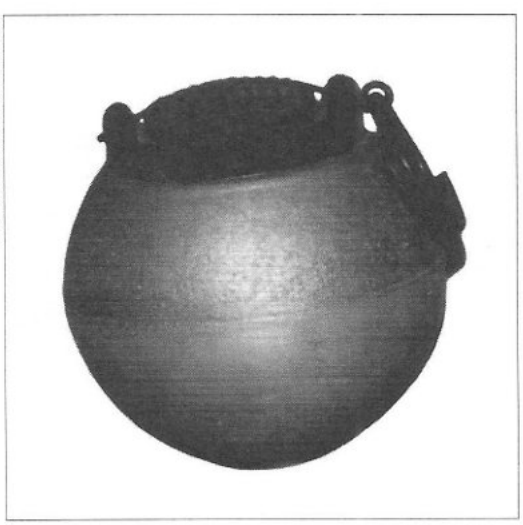


The body is made up of five aluminum parts, two stampings, a fuze ring, a filler bushing, and a sealing plug. The different pieces are brazed together forming an airtight body. The body casing is .032 inches thick and constructed from Alcoa No. 21 brazing sheet. The body is filled through a 3/8" hole in the filler bushing and then closed by the sealing plug. The body holds 7.22 ounces of white phosphorous.

The fuze mechanism used in the T28 is identical to the T5 fuze used in the T13 grenade with the exception of the size of the burster. After the safety pin is removed the cap is held down under the fingers. When the grenade is thrown, the cap is forced away from the body by the cap spring. The cap acts as a drogue, unwinding a string attached to the arming pin. When the string is fully unwound it pulls out the arming pin arming the fuze. Pulling the arming pin allows the two retaining balls to recede into the firing pin assembly and allow movement of the firing pin. Arming will take place between 15 and 25 feet from the thrower. Any impact will then detonate the grenade regardless of which part of the grenade hits first.

This grenade proved to be the most successful of all the "Beano" types. However, the grenade was not accepted into general use prior to the end of the war and in fact never made it into the production stages.

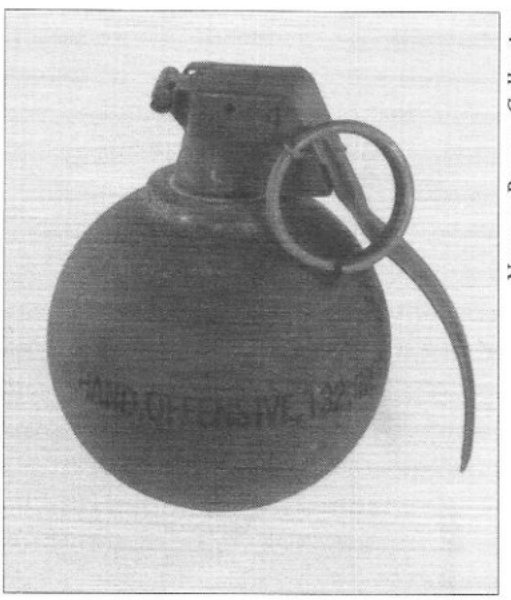
Grenade, Hand, T32
TYPE- Offensive/ Fragmentation
WEIGHT-
Body- 307 gr.
Fuze- 64 gr.
Cover- 175 gr.
DIAMETER-
Body- 73 mm
Frag Cover-76.2 mm
HEIGHT- w/o Cover 95.4 mm

This is a trials grenade designed to fulfill both the offensive and defensive role. The grenade has a thin-cased ball shaped body with a threaded fuze well in the top. A standard style time delay fuze mechanism screws into the fuze well. The safety lever is curved to conform to the shape of the body. The fuze body has the "T" lug style of connection for the safety lever.

Norman Bonney Collection

The grenade is painted olive drab with markings on the body in black. Markings give the designation of the grenade.

When used in the mode described, the grenade is in its offensive mode and the designation is "Grenade, Hand, Offensive, T32".



Norman Bonney Collection

The grenade comes equipped with a heavier fragmentation cover. The cover is constructed in two halves and hinged by a strip of metal, near the top. A clip is attached on the opposite side near the bottom. With the addition of the fragmentation cover the grenade would produce enough fragments to become a defensive or fragmentation type grenade.

The cover is painted olive drab with markings in yellow. Markings give the designation of the grenade. In this mode, the grenade is designated, "Grenade, Hand, Fragmentation, T32".

It is assumed that the grenade would be issued in the fragmentation mode, the user having the option of removing the fragmentation cover and using the grenade as an offensive type.

This grenade made it into the trials stage of testing, but was not adopted for use.

Grenade, Hand, T33

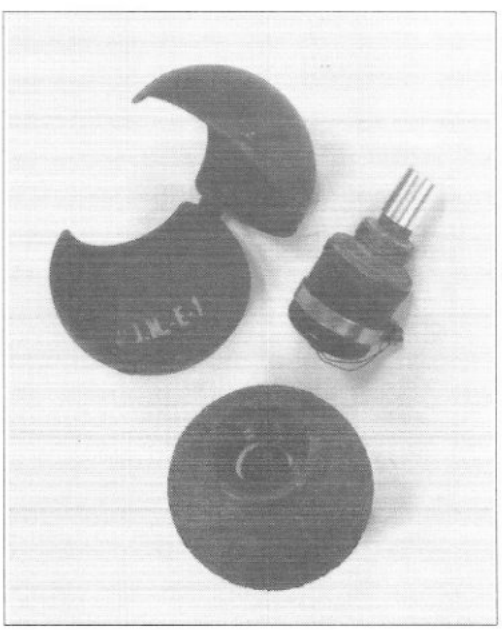
TYPE- Offensive/Fragmentation
WEIGHT-
Body- Empty- 149 gr.
Fuze- 85 gr.
Cover- 174 gr.
DIAMETER-
Body- 73 mm
Cover- 76.4 mm
HEIGHT- w/o Cover 109.4 mm

This is a trials grenade designed to fulfill both the offensive and defensive role. The body is ball shaped with a threaded fuze well in the top. The area of the fuze well is slightly raised from the body and has the upper surface flattened. The fuze mechanism is of an impact type. A band surrounds the cover of the fuze and is attached to a thick wire which attaches at the other end to a projection protruding through the fuze cover. The band and wire are tethered to the cover by a thin wire. It is assumed that the band assembly is the safety device for the grenade.

The body is painted olive green which has had sawdust or something similar mixed in giving a rough gripping surface to the grenade.

In this configuration the grenade is in the offensive mode and the designation is "Grenade, Hand, Offensive, T33".

Norman Bonney Collection



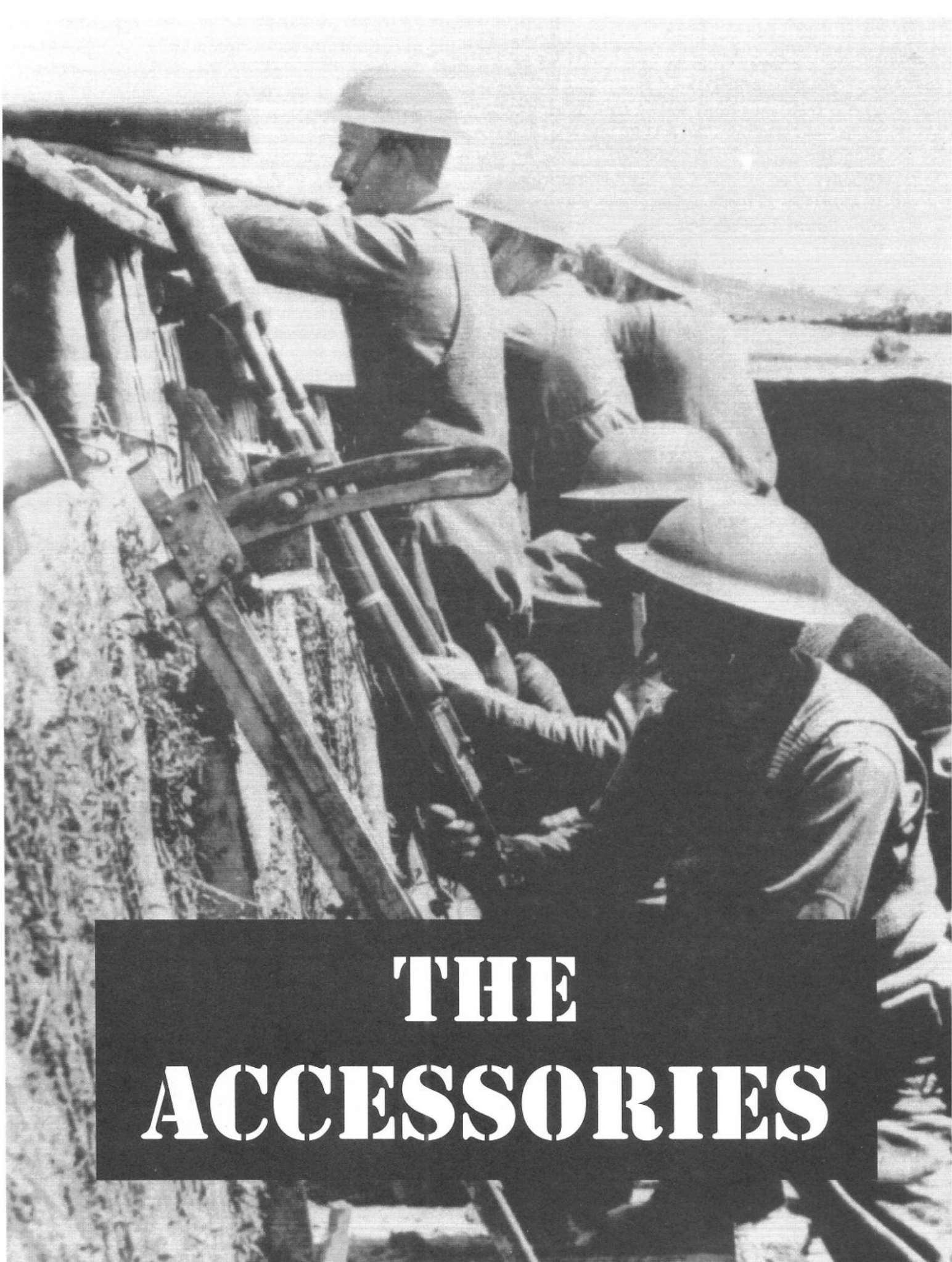
Norman Bonney Collection

The grenade comes equipped with a heavier fragmentation cover. The cover is constructed in two halves and hinged by a strip of metal, near the top. A clip is attached on the opposite side near the bottom. With the addition of the fragmentation cover the grenade would produce enough fragments to become a defensive or fragmentation type grenade. In this mode, the grenade is designated, "Grenade, Hand, Fragmentation, T33".

The cover is painted olive drab with markings in yellow. Markings give the designation of the grenade.

It is assumed that the grenade would be issued in the fragmentation mode, the user having the option of removing the fragmentation cover and using the grenade as an offensive type.

This grenade made it into the trials stage but was not adopted for use.



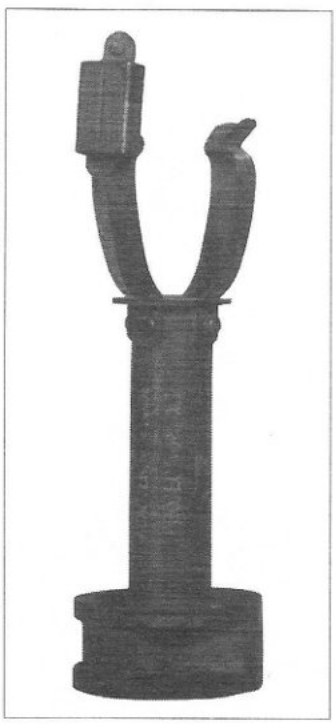
THE ACCESSORIES

Adapter, Grenade Projection, M1
TYPE- Adapter
WEIGHT- 6 oz.
HEIGHT- 7 in.
DIAMETER- 22 mm Internally
MAXIMUM RANGE- 160 metres

This adapter was designed to adapt the Mk.2 fragmentation grenade for projection from a rifle. It was invented and patented by a group of four men, Carl Panter and Joseph H. Borden of Philadelphia PA and Paul L. Christensen and Walker W. Holler of Washington D.C. The patent (Number 2,423,993) was issued on July 15, 1947, well after the adapter was in use by the US Government.

The adapter consists of a stabilizer tube, fin assembly and four gripping claws. The fin assembly is attached at the open end of the stabilizer tube and the gripping claws at the closed end. One claw is longer than the others and has an arming clip attached to it. The arming clip is retained by a small brittle piece of metal. The claws are attached to the stabilizer tube by small bolts. This adapter may be found with either closed or open type fin assemblies.

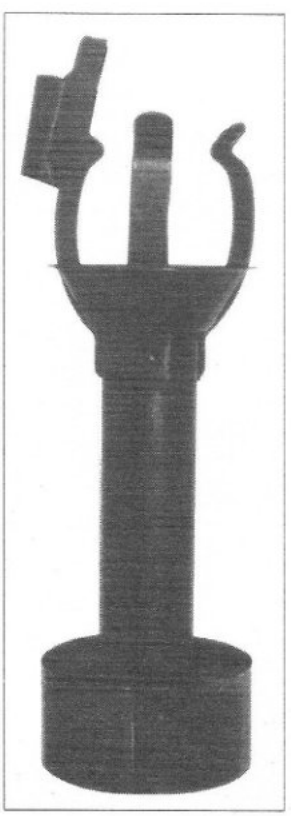
Chris Arnold Collection



The adapter is painted olive drab with black or yellow markings. Markings include the model, lot number, and date. Black markings are used on early production, yellow on later production.

The grenade was attached to the adapter by putting the safety lever into the arming clip and forcing the grenade down into the claws until the base of the grenade rests on top of the stabilizer tube.

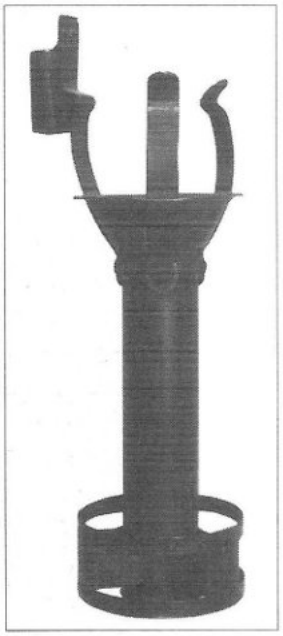
For use, load the rifle with the correct grenade launching cartridge, place the assembled grenade and adapter on the launcher, remove the safety pin from the grenade, and fire the rifle. The setback caused by firing causes the arming clip to force back on the brittle piece of metal. Under pressure from the arming clip the metal will break off, allowing the arming clip to fall free and release the safety lever of the grenade. The grenade then functions normally.



DESIGNATION- **Adapter, Grenade Projection, M1A1/M1A2**
TYPE- Adapter
WEIGHT- 6 oz.
HEIGHT- 7 in.
DIAMETER- 2.2 in.

These adapters were designed to adapt the Mk 2A1, M26, M26A1, M30, M34, M61, M62, and the Mk. 1 Illuminating grenades for firing from a rifle. The M1A2 adapter also saw Canadian service where it was used to adapt the HCC1A1 smoke grenade.

The adapter consists of a fin assembly, stabilizer tube, cup, and three metal claws. An arming clip is attached to the longest of the claws, held in place by a small extension of brittle metal. The fin assembly is attached to the open



end of the stabilizer tube, the cup and claws to the opposite end.

This adapter differs from the M1 adapter in the following manner.

-The M1A1 and M1A2 have three claws instead of four.

-The M1A1 and M1A2 have a cup on the end of the stabilizer tube.

The M1A1 and M1A2 differ only in construction of the fin assembly. The M1A1 having a solid ring and the M1A2 having the later open style.

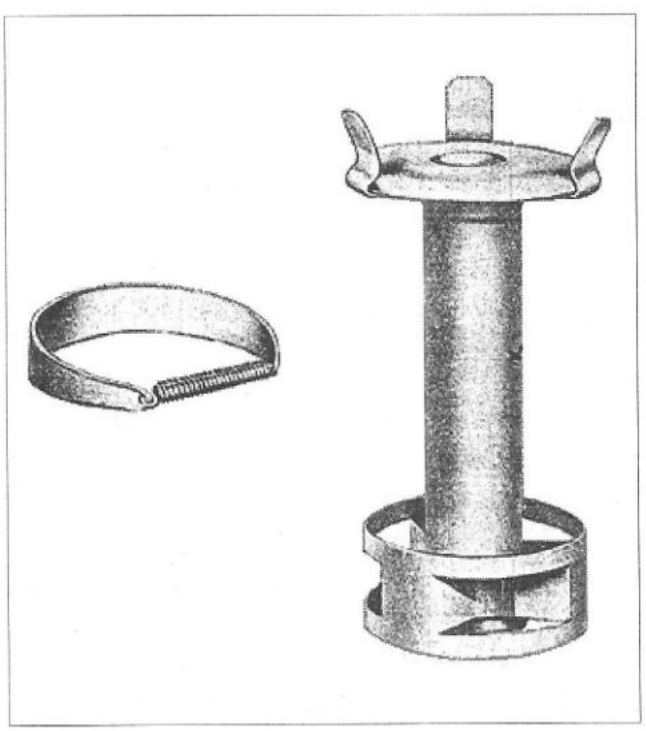
The adapters are painted olive drab with yellow markings. Markings include the model, lot number, and date of manufacture.

Grenades are fitted into the adapter by placing the safety lever into the arming clip and forcing the grenade down into the claws until the base of the grenade fits fully into the cup. On firing the arming clip moves rearward striking the small extension. The force of the arming clip striking the extension breaks it, allowing the arming clip to fall off and release the safety lever of the grenade. The grenade then functions normally.

Adapter, Grenade Projection, M2/M2A1
TYPE- Adapter
HEIGHT- 5 in.
DIAMETER- 22 mm Internally
COLOUR- Grey with black markings

This adapter was designed to allow cylindrical chemical grenades to be fired from a rifle. This adapter allows the firing of the M6 series, M7 series, AN-M8, AN-M14, M18, and M54 chemical hand grenades.

The adapter consists of five main parts, a fin assembly, stabilizer tube, base plate, three short gripping claws, and a setback band. The fin assembly is attached to the open end of the stabilizer tube and the base plate and claws to the closed end. The adapter is constructed of sheet steel.

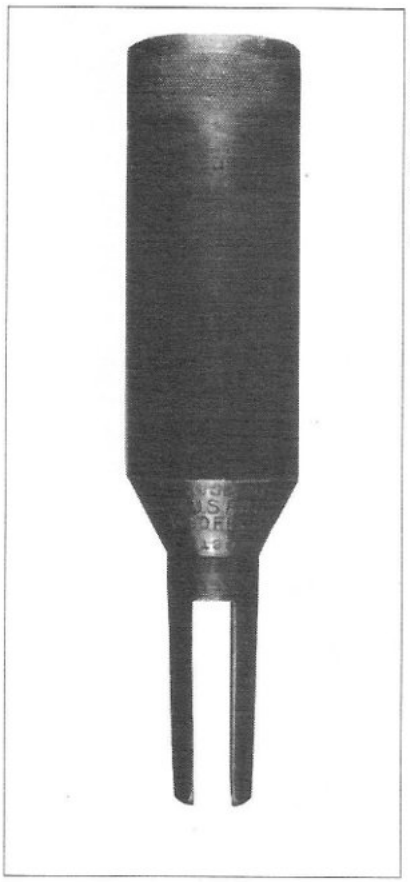


The differences between the M2 and the M2A1 are in the method of attaching the base plate and claws to the stabilizer tube. As well the M2 fin assembly has a solid ring and the M2A1 has a perforated ring.

These adapters are painted grey with black markings. Markings include the model, lot number, and date of manufacture. Grenades are mounted on the adapter by forcing down into the claws which then grip the base of the grenade. The setback band is placed around the body of the grenade with the spring centred over the safety lever ½ inch above the bottom of the lever. The force of firing causes the setback band to move to the rear, releasing the safety lever and allowing the grenade to function normally.

Rifle Grenade Discharger, VB
TYPE- Cup Discharger
DIAMETER- Inside- 2 in.

There were a number of models of the Viven- Bessiere launcher used by the American Army and Navy. The first type to be used were French manufactured launchers modified to fit the American Rifles. These are identified by the straight slots, a raised rib around the top and a raised, knurled band around the base of the tube. French launchers were modified for both the M1903 and M1917 rifles by having the length and width of the slot modified to fit the appropriate rifle. These launchers are designated the Mk.I.



Rex Gallogly Collection

There were some problems in adapting the system to the American rifles. There was a variation in the outside diameter of the barrel on American rifles with caused the launchers to fit loosly and sag. The looseness caused the launchers to move forward making a gap at the muzzle and allowing gas to escape. The loss of gas pressure reduced the range of the grenade to unacceptable ranges.

The Mk. II launchers were experimental only and were not produced. The first American manufactured launchers to be produced were designated Mk. III, again for the M1903 and M1917 rifles. These are identified by having a straight barrel without the raised rib and straight slots. They were fitted onto the rifle and shimmed with a spring steel shim to tighten it to the barrel. The launchers were intended to be held in place by friction.

The model for the M1903 has a smooth barrel and the model for the M1917 has a knurled band at the top end of the barrel. As the Americans and French pooled their grenades, both French or American grenades might be issued. The central tube of the American grenade is slightly larger than that in the French. When French grenades were used with American rifles and ammunition excessive pressures may result. Therefore it was recommended that the American launchers have two holes drilled in the launchers to vent the excess gas pressure. Launchers may be found with or without holes. These launchers were declared obsolete on 8 April, 1931.

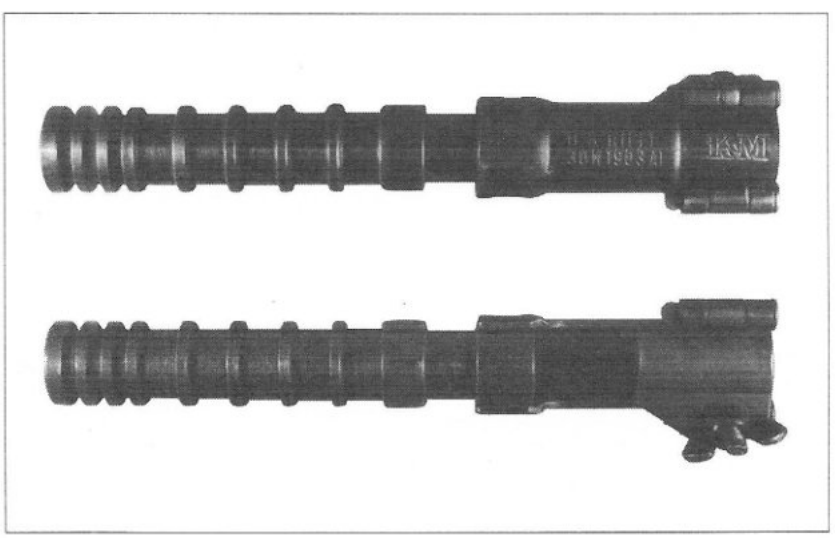
The next modification of the launcher was designated the Mk IV. These launchers have slots which are curved to twist onto the rifle in a manner that locks it around the foresight. A spring passes around the foresight locking the launcher firmly onto the rifle. Again there

were two versions of the launcher, one for the M1903 rifle and one for the M1917 rifle. As well as markings on the launcher identifying which rifle the launcher is designed for they may be identified by the barrel of the launcher. The launcher for the M1903 having a smooth barrel and the launcher for the M1917 having a knurled band near the top of the barrel. These launchers were declared obsolete on 10 April, 1939.

American manufactured launchers are normally marked on the taper from the launcher barrel to the mounting tube. Markings will include the designation of the launcher, rifle to be used with, and most likely the manufacturer of the launcher. Typical marking are "For use on US Rifle Model of 1906" or "For use on US Rifle Model of 1917"

Launcher, Grenade, M1/M2
TYPE- Spigot Launcher
WEIGHT- .53 lb.
DIAMETER- .86 in.
BORE DIAMETER- .50 in.

The spigot type grenade launching attachment was adopted in 1940 for use with the M9 anti tank Rifle grenade. The model adopted for the M1903 rifle was designated Launcher, Grenade, M1. It could



be used on the "Rifles, US Cal. .30, M1903, M1903A1, M1903A3, and M1903A4". There were two variations on the M1 launcher but no designation changes were made. The first variation has a narrow barrel locking clamp, which allowed the launcher to move forward and gas pressure to escape. In 1942 a wider clamp was designed which restricted the forward movement and prevented the loss of gas pressure.

The launcher consists of a barrel and clamp attachment. The barrel fit over the muzzle end of the rifle with the solid portion of the clamp attachment on the bottom of the rifle barrel. The barrel locking clamp is hinged and fits over the top of the barrel behind the foresight. The launcher is attached to the rifle by the clamp and is secured with a wing nut. The launcher is finished by blueing. Marking are stamped into the launcher on the outside of the solid portion of the clamp attachment.

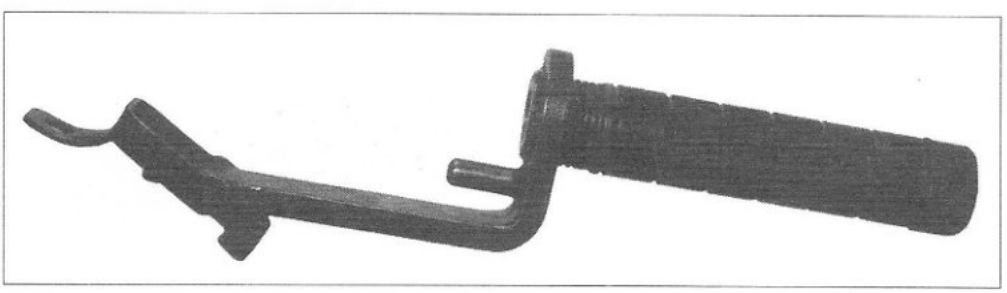
The markings identify the rifle model the launcher is designed for and may have a manufacturers mark.

A rubber recoil pad was supplied with each M1 launcher. The pad easily fit over the butt of the rifle to protect the rifle when used with the butt resting on ground. The pad has the Ordnance bomb, "US", and a number moulded onto the butt end.

The M2 launcher was designed to fit the "Rifle, US Cal. 30, M1917". It differs from the M1 launcher only in the size of the hole to fit the muzzle of the rifle. The hole on the M1 is slightly larger than the M2. Many M2 launchers were later converted to M1 configuration by enlarging the hole for the muzzle. Markings were changed by stamping "03" over the "17" on the original markings. The converted launchers were then parkerized.

Launcher, Grenade M7
TYPE- Spigot Launcher
DIAMETER- 22 mm
LENGTH- 19 cm
WEIGHT- 12 oz.

This launcher is designed to fit the "Rifle, US Cal. .30, M1". The launcher consists of a barrel which has a large groove near the muzzle containing a circular grenade retaining spring, and six smaller grooves along the length of the barrel, numbered 1 to 6. The smaller grooves determine the range of the grenade but the numbers have no range value as such. The barrel is screwed and staked into the base. The base has a stud mounted just below the barrel which fits into a special gas cylinder valve and allows excess gas to escape upon firing. The stud is long enough to hold the valve open as long as it is attached to the rifle preventing the rifle from firing semi-automatically. The gas cylinder valve is supplied along with the launcher. A retaining catch is fitted near the rear of the launcher. The launcher is marked on the bottom of the base with the model of the launcher and the rifle it is designed for.



The launcher is mounted on the rifle by sliding the barrel onto the end of the rifle barrel, ensuring the stud engages in the gas valve, engaging the bayonet lug in the notch at the rear of the launcher and closing the latch over the bayonet stud.

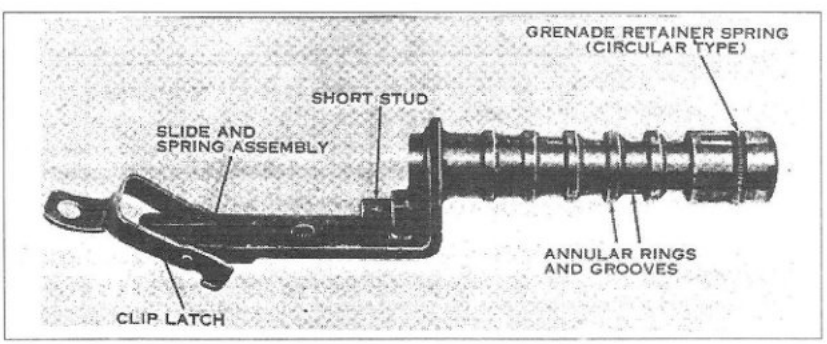
Rifles designated to fire grenades must be equipped with a new operating rod spring (B147568) having a free length of 20.25 inches. If normal springs are used, the follower rod will become disengaged causing stoppages when normal ball ammunition is fired.

Normal ball ammunition may be fired through the launcher when fitted, however the weight of the launcher will effect the zero of the rifle. Ball ammunition must never be fired when a grenade is mounted on the launcher. Grenades are launched using an M3 Grenade Launching Cartridge.

Launcher, Grenade, M7A1
TYPE- Spigot launcher
DIAMETER- 22 mm
LENGTH- 19 mm
WEIGHT- 340 gm

The design of the barrel has been changed on this model. The annular rings are numbered from 1 to 6. A shorter stud is fitted and a slide and spring assembly has been fitted in the rear of the launcher. This assembly allows the launcher to recoil slightly when grenades are fired, opening the gas valve and allowing excess gas to escape. After the grenade has left the launcher, it moves forward under pressure from the spring, allowing the gas valve to close. This assembly allows the rifle to fire in the semi automatic mode with the launcher fitted.

The circular grenade retaining springs used on this launcher and the M7 were found to wear out, allowing grenades to fall off the launcher when tipped down.



Launcher, Grenade, M7A2
TYPE- Spigot Launcher
DIAMETER- 22mm

This model has been modified with a built up shoulder at the top rear of the barrel and a new style grenade retaining spring. The new clip type retaining spring eliminates the problem of grenades sliding off the launcher when the barrel is depressed. The annular grooves are numbered 1 to 6.

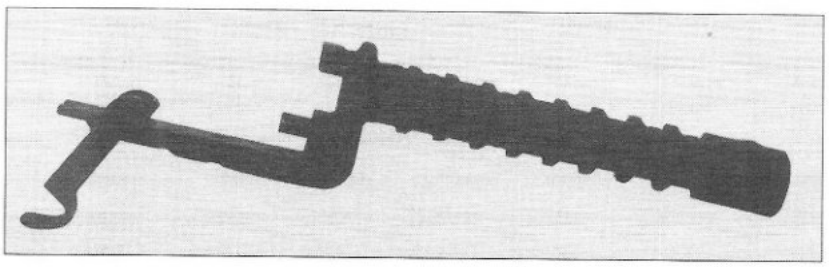
Launcher, Grenade, M7A3
TYPE- Spigot launcher
WEIGHT- .75 lb.
DIAMETER- 22 mm
LENGTH- 23 cm

This launcher is designed to fit the M1 rifle. The barrel of the launcher is longer (5.75 in.) than the earlier versions of the M7 series. The longer barrel is for launching the newer series of anti tank grenades (M28 and M31). The barrel has nine annular rings and grooves, numbered from "6" at the muzzle to "4A" at the base. The muzzle of the launcher has a clip type retainer spring which holds the grenade in the desired position.

A slide and spring mechanism in the launcher base fits against the bayonet stud. This allows the launcher to move slightly to the rear upon firing, causing the stud which rests on the valve in the gas cylinder to force open the valve and allow excess gases to escape preventing damage to the rifle. the launcher is returned to normal position by the compressed spring in the base, withdrawing the stud and allowing the valve to close.

The launcher is fitted onto the rifle in the same manner as the earlier versions.

Grenades are launched by using and M3 Grenade launching cartridge. Ball ammunition may be fired through the launcher but the weight of the launcher will effect the accuracy of the rifle. Ball ammunition must not be used to launch grenades or fired when a grenade is mounted on the launcher.

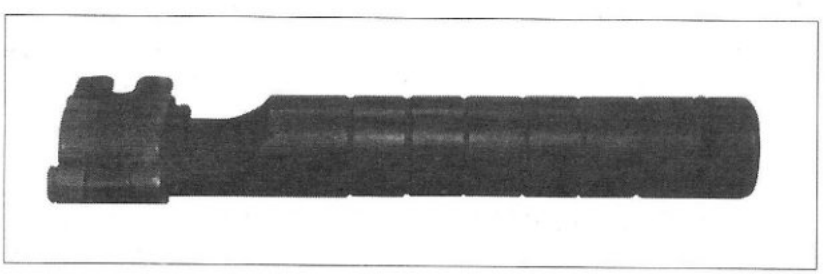


Launcher, Grenade, M8
TYPE- Spigot launcher
WEIGHT- 11.5 oz.
DIAMETER- 22 mm
LENGTH- 6 in.

This launcher is designed for use with the .30 Carbines, M1, M1A1, and M2. The launcher consists of a barrel with a retaining spring at the muzzle end, six concentric rings marked from "1" to "6" at the muzzle end, and a clamp at the rear.

The launcher is mounted on the carbine by pushing the launcher onto the barrel until the clamp passes the foresight, engaging the clamp behind the foresight and tightening the clamping bolt.

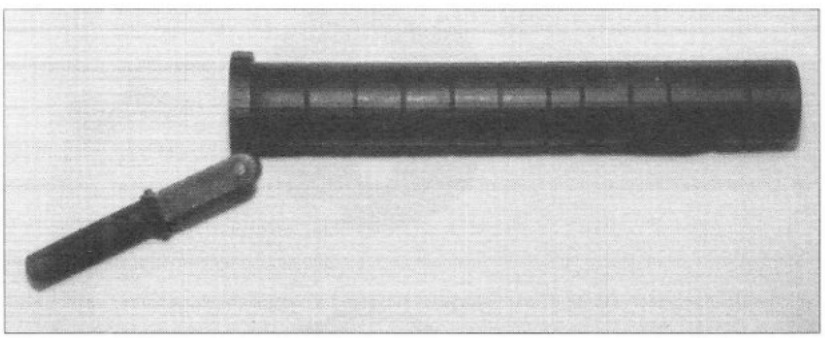
This launcher is used with a special grenade launching cartridge (Carbine grenade cartridge, caliber .30, M6). Ball ammunition may be fired through the launcher but must not be used to launch grenades.



Launcher, Grenade, M76
TYPE- Spigot launcher
WEIGHT- 200 gm
LENGTH- 21 cm
DIAMETER- 22 mm

This launcher is designed for use with the M14 rifle. The launcher consists of a barrel with 9 annular grooves marked from "4A" at the base to '6" near the muzzle. A grenade retainer spring is attached to the bottom of the barrel near the muzzle end. A clip latch assembly is attached to the base of the barrel. The launcher is attached to the rifle by sliding the launcher over the flash suppressor and securing the latch over the bayonet lug.

Grenades are launched using the M64 grenade launching cartridge. Ball ammunition may be fired through the launcher but must not be used to launch grenades. The annular grooves are used to obtain different ranges by setting the grenade at different positions on the launcher.



Retainer Spring, Grenade

This retainer spring is designed for use with the M16 and M16A1 rifles. The spring is mounted on the rifle behind the flash suppressor. The flash suppressor of the M16 series of rifle has an outside diameter of 22mm and the retainer spring is designed to retain the grenade on the rifle until fired. The combination of the flash suppressor and retainer spring eliminate the requirement of a separate grenade launching attachment. Grenades are launched using the M195 grenade launching cartridge. The retaining springs must be replaced after firing 30 grenades.

Sight, Rifle, Grenade Launcher, M1
TYPE- Sight

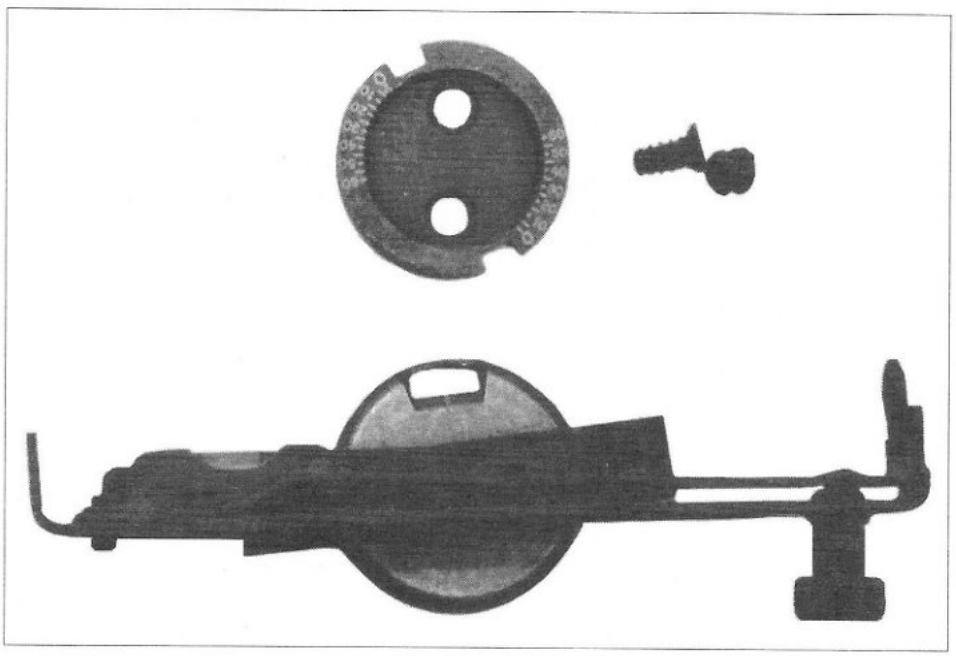
These sights were developed for use with the M1 grenade launcher. The sight consists of two sight parts, two springs, and a spacer wire. The sight parts, front and rear, were formed from sheet metal stampings which are shaped to fit on top of the rifle stock. The front sight blade and rear sight opening were simply extensions of the stampings extending down the left side of the stock. Notched extensions on top of the stampings, when aligned with themselves and the foresight of the rifle ensured the proper positioning of the sights on the rifle.

The sight pieces were held onto the rifle by two springs wrapped around the stock. The front piece located just behind the lower band and the rear piece at the front end of the receiver. The wire or cord spacer between the two pieces ensured the correct distance between sights.

These crude sights could easily be knocked or bumped out of alignment causing inaccurate firing of grenades. In addition, the M1 sights were only used for firing the M9 or M9A1 Anti tank Rifle grenade and only from the shoulder. They could not be used for indirect fire.

Sight, Rifle, Grenade Launcher, M15
TYPE- Sight

This sight was developed during the Second World War for use with grenade launcher attachments. This sight can and has been used on most American service rifles including the M1903 Rifle, M1 Rifle, M1 Carbine, and M14 Rifle. Initially introduced as the T59 sight it went through several modifications, T59E1, T59E2, and finally the T59E3. The T59E3 was standardized in March 1944 as the "Sight, Rifle, Grenade Launcher, M15".



The sight consists of a mounting plate and sight assembly. The mounting plate is fixed to the rifle by two screws and has an elevation scale imprinted on the outer edge. The scale is calibrated in 5 degree increments from 0-60 degrees. The mounting plate must be installed by an armourer using a special jig to ensure it is correctly positioned. The sight assembly consists of a sight bar, front sight post, rear peep sight, elevating screw, and a levelling bubble. The front sight is actually an integral part of the sight bar. The rear sight is mounted on a sight leaf which is adjustable for windage and elevation. The rear sight has 4 one degree graduations marked on it. The elevating screw makes changes in elevation of 12 minutes per click. The levelling bubble is mounted on the sight bar near the front of the sight. The sight bar is attached to a mounting bracket which fits over the mounting plate and attaches the sight to the rifle.

The sights are used for direct fire by sighting through them just as normal rifle sights are used. Grenades are placed on the launcher fully to the rear.

For indirect fire, the levelling bubble is used. The sight bar assembly is rotated until the appropriate degree setting on the mounting plate is lined up with the indexing line on the mounting bracket. The rifle is then raised or lowered until the bubble is centred in its vial. This ensures the rifle is at the desired angle. Indirect fire tables for different grenades are provided as a guide, ranges with different rifles and launchers will vary. The ranges given in the tables depend not only on the angle of elevation, but also with the position of the grenade on the launcher. This is where the annular grooves on the launchers comes into play. For longer ranges the grenade is placed further down on the launcher.

Launching Cartridges

Cartridge, VB Grenade Practice

This cartridge was designed for use on practice ranges. When service ammunition was used to launch VB grenades, the danger area was far greater for the round than for the grenade. In the 1920's, a wooden bullet cartridge was developed to allow VB grenades to be fired on shorter ranges. A typical headstamp for this cartridge is FA VB 33 (Frankford Arsenal, Viven-Bessiere, 1933). This cartridge continued to be loaded until 1939.

Cartridge, Blank, Chemical Rifle Grenade, Caliber .30, M1

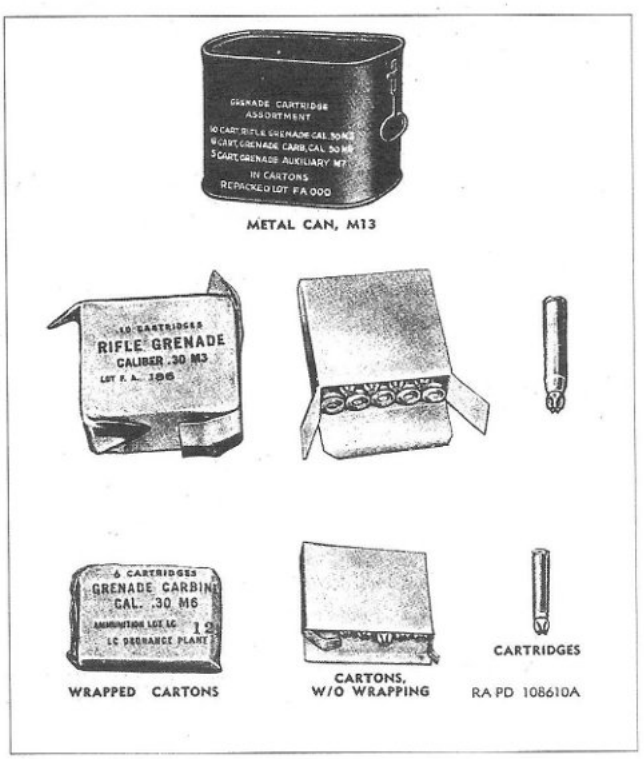
This cartridge was issued only for use with chemical rifle grenades. The cartridge was loaded with 5 grains of black powder and 50 grains of Pyro D. G. powder. The casing is a standard service cartridge case with primer. The neck is closed with a 5 point rose crimp, eliminating the need of a wad to retain the powder in the case. A typical headstamp is FA CRG 27 (Frankford Arsenal, Chemical Rifle Grenade, 1927).

Cartridge, Rifle Grenade, Caliber .30, M2

Developed from the M1 in early 1940, this cartridge was only produced in experimental quantities. It was found to produce too much recoil on firing and so was not adopted for use.

Cartridge, Rifle Grenade, Caliber .30, M3

Adopted as standard on 9 September 1941, this cartridge was used in the M1903 and M1 rifles. Originally loaded with 5 grains of black powder and 40-45 grains of IMR 4676 this cartridge went through a number of different loadings. Changes in the weights of the grenades being fired required changes in the loading of the launching cartridge. By the end of the Second World War the cartridge was loaded with 5 grains of black powder and 40 grains of IMR 4895 powder. It is closed by a red water-proofed wad below a five pointed crimped end.



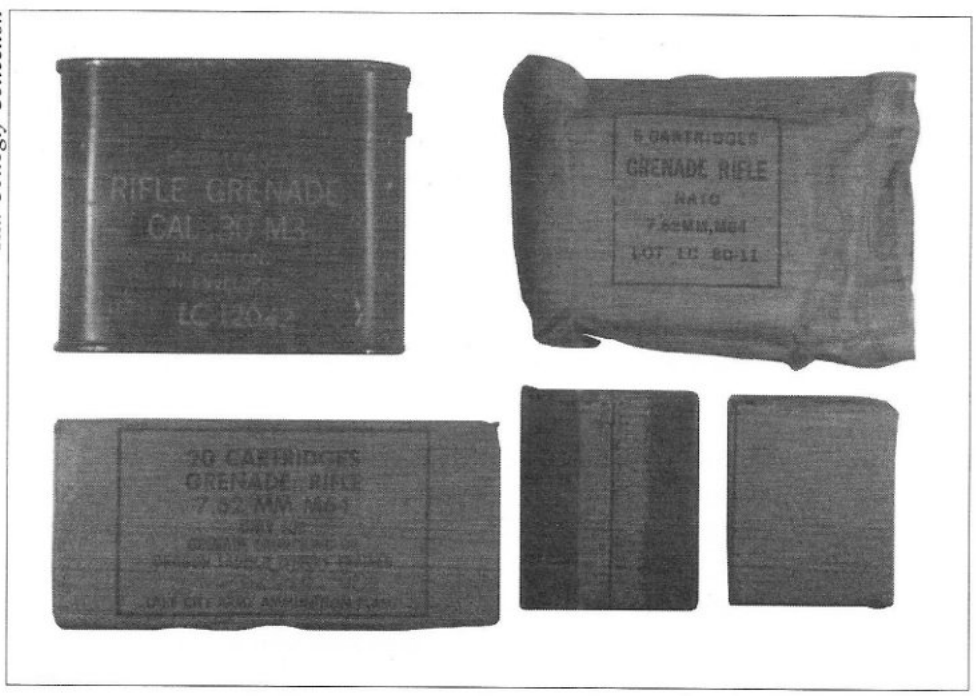
Cartridge, Rifle Grenade, M6

This cartridge is used with the Carbines, M1, M1A1, M1A3 and M2. Originally designated the T6 this cartridge became the M6 being adopted on 11 Feb. 1943. The original loading was one grain of 60mm mortar ignition propellant next to the primer and topped with 19 grains of IMR 4809. Later loadings have one grain of 60mm propellant and 20 grains of DuPont EX-4809-6.

Cartridge, Grenade, Auxiliary, M7

This cartridge is used in conjunction with the M3 cartridge and fits the M1, M2, or M7 launchers. The cartridge is similar is size and shape to a caliber .45 case and is in actual fact, what is formed from the third draw step of a Cal .45 cartridge case. The casings may be found in either brass or steel, normally without a head-stamp.

Rex Gollogly Collection



One end is closed and has a rim to retain the cartridge in place, the other end is closed by a red paper wad. The case is loaded with 20 grains of powder. This cartridge is placed in the end of the launcher with the paper end down, the rim of the case retaining the cartridge in place. Use of this cartridge increases the range of the grenade when launched from a rifle, it is not used with the carbine. When the normal M3 cartridge is fired it ignites the M7 cartridge.

Rifle Grenade Cartridge, M64

This cartridge is 7.62 x 51 mm NATO and used in the M14 rifle with the M76 launcher. The charge is a mixture of number A4 black powder and IMR 4895 totalling 40.12 grains. It may also be found loaded with 45 grains of WC830. The brass casing is closed by a five point rosette crimp with a waterproofing wad underneath. It will normally have a red crimp sealant.

Rifle Grenade Cartridge, M195

The M195 5.56 x 45mm cartridge was standardized on 23 June 1966. It has a seven point rosette crimp with a waterproofing wad underneath. The crimp is sealed with a red sealant. The loading is 25 grains of IMR 4475. This cartridge is used with the M16 and M16A1 rifles.

40mm Grenades

This book will not provide descriptions of the 40mm Grenades used in the M79 or M203 Grenade launchers or the M75, M129, or Mk. 19 Mod 1 mounted launchers. This listing is provided as a quick reference to some of the 40mm Grenade Cartridges available. Note that not all of the Cartridges listed have been adopted as standard.

Model	*Type*	*Weapon*
Cartridge, 40mm, M381	HE, Ground Burst	M79 or M203
Cartridge, 40mm, M382	Practice	M79 or M203
Cartridge, 40mm, M383	HE, Ground Burst	M75, M129, or Mk. 19
Cartridge, 40mm, M384	HE, Ground Burst	M75, M129, or Mk. 19
Cartridge, 40mm, M385	Practice	M75, M129, or Mk. 19
Cartridge, 40mm, M386	HE, Ground Burst	M79 or M203
Cartridge, 40mm, M397	HE, Airburst	M79 or M203
Cartridge, 40mm, M397A1	HE, Airburst	M79 or M203
Cartridge, 40mm, M406	HE, Ground Burst	M79 or M203
Cartridge, 40mm, M407A1	Practice	M79 or M203
Cartridge, 40mm, M430	HEDP	M75, M129, or Mk. 19
Cartridge, 40mm, M433	HEDP	M79 or M203
Cartridge, 40mm, M441	HE, Ground Burst	M79 or M203
Cartridge, 40mm, M463	HE, Ground Burst	M79 or M203
Cartridge, 40mm, M576	Multiple Projectile	M79 or M203
Cartridge, 40mm, M576E1	Multiple Projectile	M79 or M203
Cartridge, 40mm, M576E2	Multiple Projectile	M79 or M203
Cartridge, 40mm, M583	Signal, White star Parachute	M79 or M203
Cartridge, 40mm, M583A1	Signal, White star Parachute	M79 or M203
Cartridge, 40mm, M585	Signal, White star Cluster	M79 or M203
Cartridge, 40mm, XM651E1	Gas, CS	M79 or M203
Cartridge, 40mm, XM658	Signal, Green Smoke, Parachute	M79 or M203
Cartridge, 40mm, XM659	Signal, Red Smoke, Parachute	M79 or M203
Cartridge, 40mm, XM660	Signal, Yellow Smoke, Parachute	M79 or M203
Cartridge, 40mm, XM661	Signal, Green Star Parachute	M79 or M203
Cartridge, 40mm, XM662	Signal, Red Star Parachute	M79 or M203
Cartridge, 40mm, XM663	Signal, Green Star Cluster	M79 or M203
Cartridge, 40mm, XM664	Signal, Red Star Cluster	M79 or M203
Cartridge, 40mm, XM669	Signal, Violet Smoke, Parachute	M79 or M203
Cartridge, 40mm, XM674	Riot Control, CS Gas	M79
Cartridge, 40mm, XM675	Riot Control, CS Gas	M79

Cartridge, 40mm, M676	Signal, Yellow Smoke, Canopy	M79 or M203
Cartridge, 40mm, M677	HE, Tracer	M75, M129, or Mk. 19
Cartridge, 40mm, XM679	Signal, Green Smoke Canopy	M79 or M203
Cartridge, 40mm, M680	Signal, White Smoke, Canopy	M79 or M203
Cartridge, 40mm, XM681	Signal, Violet Smoke, Canopy	M79 or M203
Cartridge, 40mm, M682	Signal, Red Smoke, Canopy	M79 or M203
Cartridge, 40mm, M684	HE, Airburst	M75, M129, or Mk. 19
Cartridge, 40mm, XM695	Signal, Orange Star, Parachute	M79 or M203
Cartridge, 40mm, XM696	Signal, Yellow Smoke Streamer	M79 or M203
Cartridge, 40mm, XM697	Signal, Green Smoke Streamer	M79 or M203
Cartridge, 40mm, XM698	Signal, Orange Smoke Streamer	M79 or M203
Cartridge, 40mm, XM699	Signal, Red Smoke Streamer	M79 or M203
Cartridge, 40mm, XM700	Signal, Brown Smoke Streamer	M79 or M203
Cartridge, 40mm, XM701	Signal, Violet Smoke Streamer	M79 or M203
Cartridge, 40mm, M713	Signal, Red Smoke	M79 or M203
Cartridge, 40mm, M715	Signal, Green Smoke	M79 or M203
Cartridge, 40mm, M716	Signal, Yellow Smoke	M79 or M203

Glossary

Bouchon-	(Fr.) meaning "stopper or plug". Used to identify the early fuze mechanisms of American grenades. This is a holdover from the First World War when the French fuze mechanisms were called Bouchons.
EOD-	Explosive Ordnance Disposal
FM-	Field Manual
Fuse-	The actual time fuse. Normally a component of the grenade fuze.
Fuze-	An assembly of parts forming the ignition mechanism of a grenade.
H.E.-	High explosive
H.E.A.T.-	High Explosive Anti Tank
HEDP-	High Explosive, Dual Purpose, Used in 40mm Grenades this type has a limited armour piercing capability.
in.-	inch
Lachrymatory-	A gas which causes involuntary weeping.
lb.-	pound
Lot Number.	The lot number is an important factor in the identification of ammunition. It is assigned at the time of manufacture to a definite amount of ammunition which is assembled under uniform conditions and generally contains, in the case of grenades, bodies of one type or lot number, explosive or chemical filler of one lot number, and fuzes of one lot number. The grouping of like components results in a lot of ammunition which may be expected to function in a uniform manner during its serviceable life.
mm-	millimetre
Ogive-	A wind shield found on rifle grenades.
oz.-	ounce
PIBD-	Point initiated, base detonating
TM-	Technical Manual
UXO-	Unexploded Ordnance
VB-	Viven-Bessiere
Vesicant-	Capable of producing blisters

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